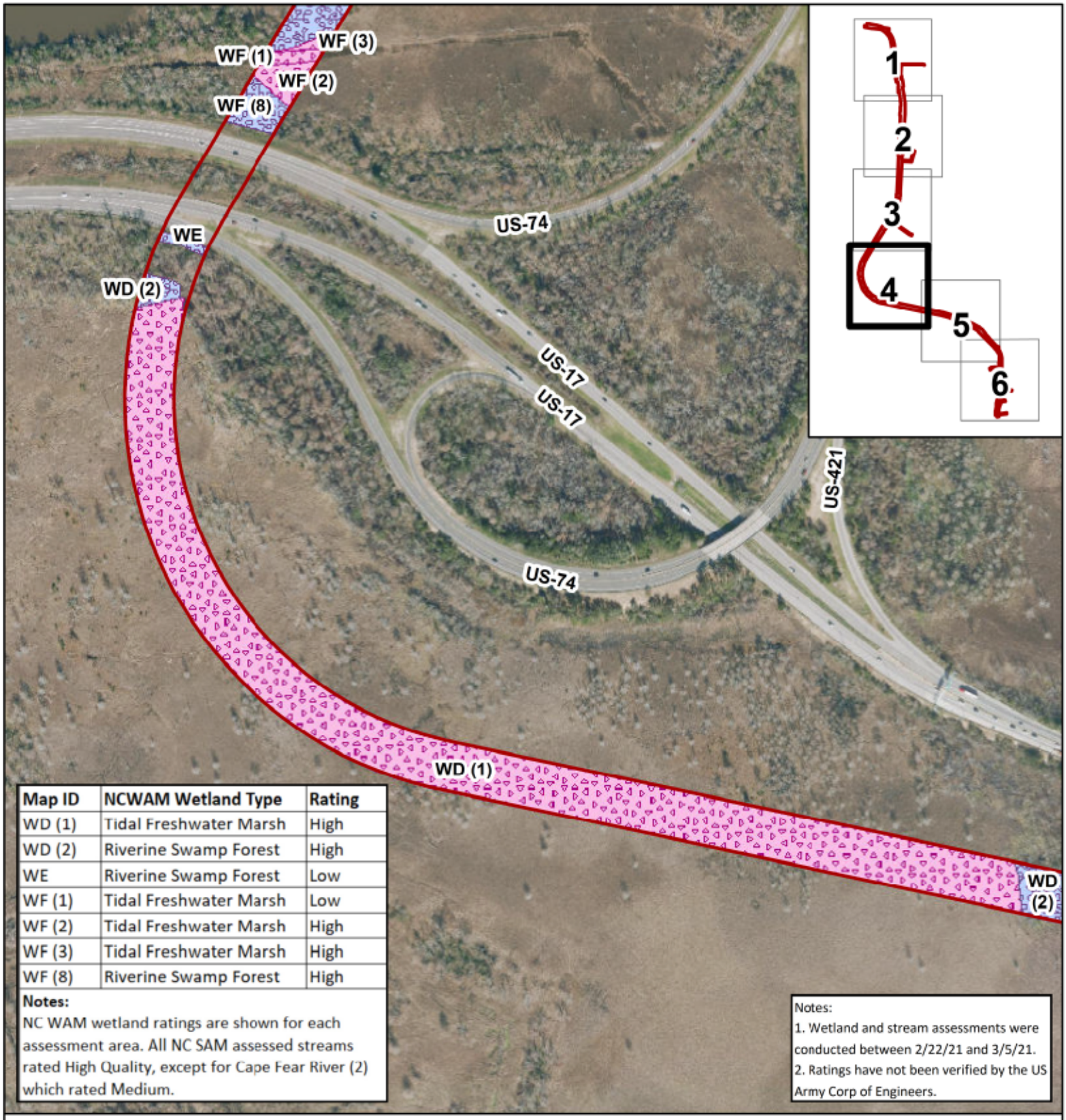


Map ID	NCWAM Wetland Type	Rating
WD (1)	Tidal Freshwater Marsh	High
WD (2)	Riverine Swamp Forest	High
WE	Riverine Swamp Forest	Low
WF (1)	Tidal Freshwater Marsh	Low
WF (2)	Tidal Freshwater Marsh	High
WF (3)	Tidal Freshwater Marsh	High
WF (8)	Riverine Swamp Forest	High

Notes:
NC WAM wetland ratings are shown for each assessment area. All NC SAM assessed streams rated High Quality, except for Cape Fear River (2) which rated Medium.

Notes:
1. Wetland and stream assessments were conducted between 2/22/21 and 3/5/21.
2. Ratings have not been verified by the US Army Corp of Engineers.

CITY OF WILMINGTON NORTH CAROLINA

Wilmington Rail Realignment Project

New Hanover County and Brunswick County, NC

Source: Esri Aerial Imagery

Legend

- Preferred Alternative Impact Area
- NCSAM Assessed Streams
- Railroad

NCWAM Assessed Wetlands

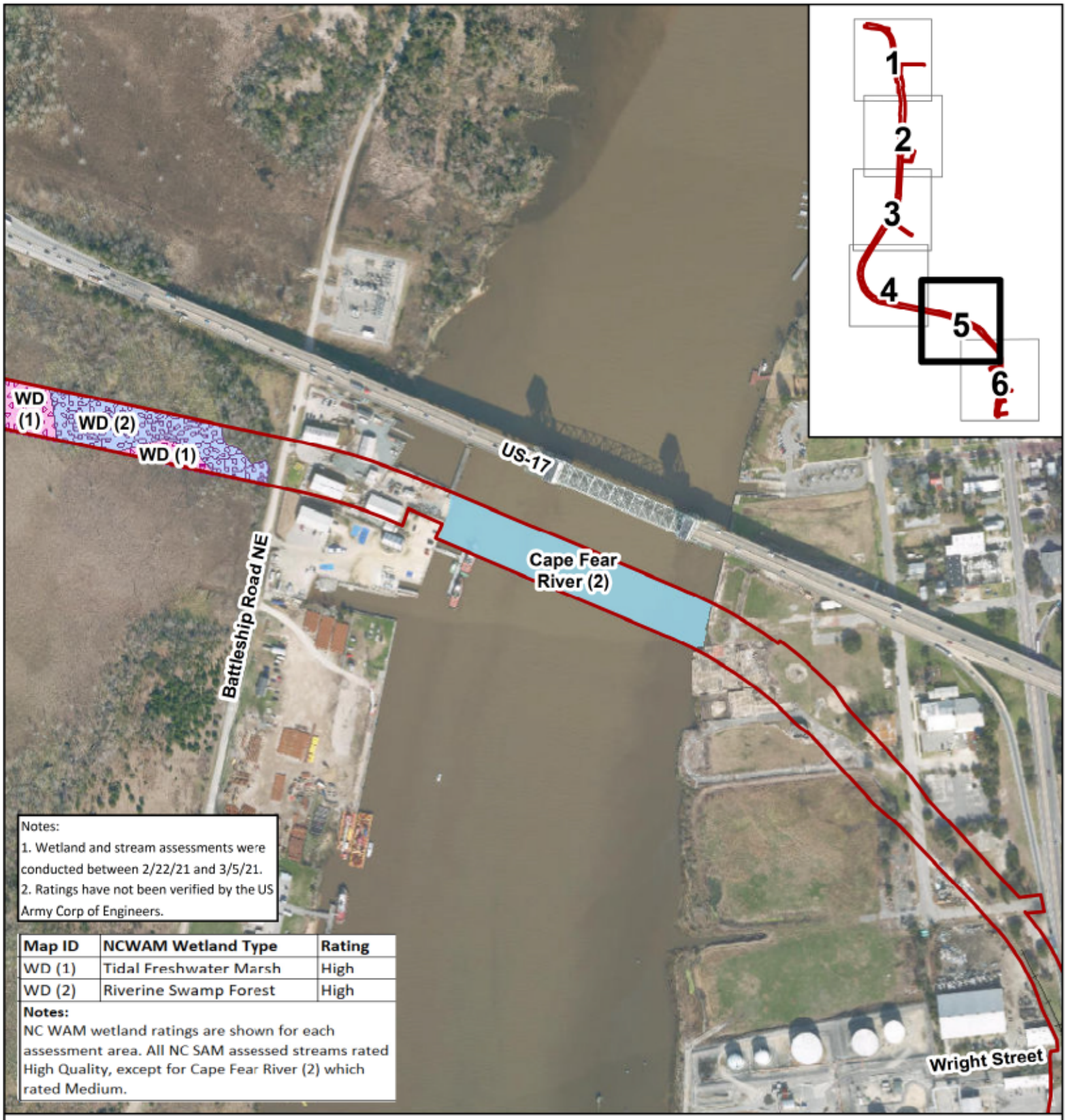
- Riverine Swamp Forest
- Tidal Freshwater Marsh

Figure 9-4
Stream and Wetland Assessment Ratings Map

Date: January 2022

0 0.025 0.05 0.1
Miles

1 inch = 400 feet



Notes:
1. Wetland and stream assessments were conducted between 2/22/21 and 3/5/21.
2. Ratings have not been verified by the US Army Corp of Engineers.

Map ID	NCWAM Wetland Type	Rating
WD (1)	Tidal Freshwater Marsh	High
WD (2)	Riverine Swamp Forest	High

Notes:
NC WAM wetland ratings are shown for each assessment area. All NC SAM assessed streams rated High Quality, except for Cape Fear River (2) which rated Medium.

CITY OF WILMINGTON NORTH CAROLINA

Wilmington Rail Realignment Project

New Hanover County and Brunswick County, NC

Source: Esri Aerial Imagery

Legend

- Preferred Alternative Impact Area
- NCSAM Assessed Streams
- Railroad

NCWAM Assessed Wetlands

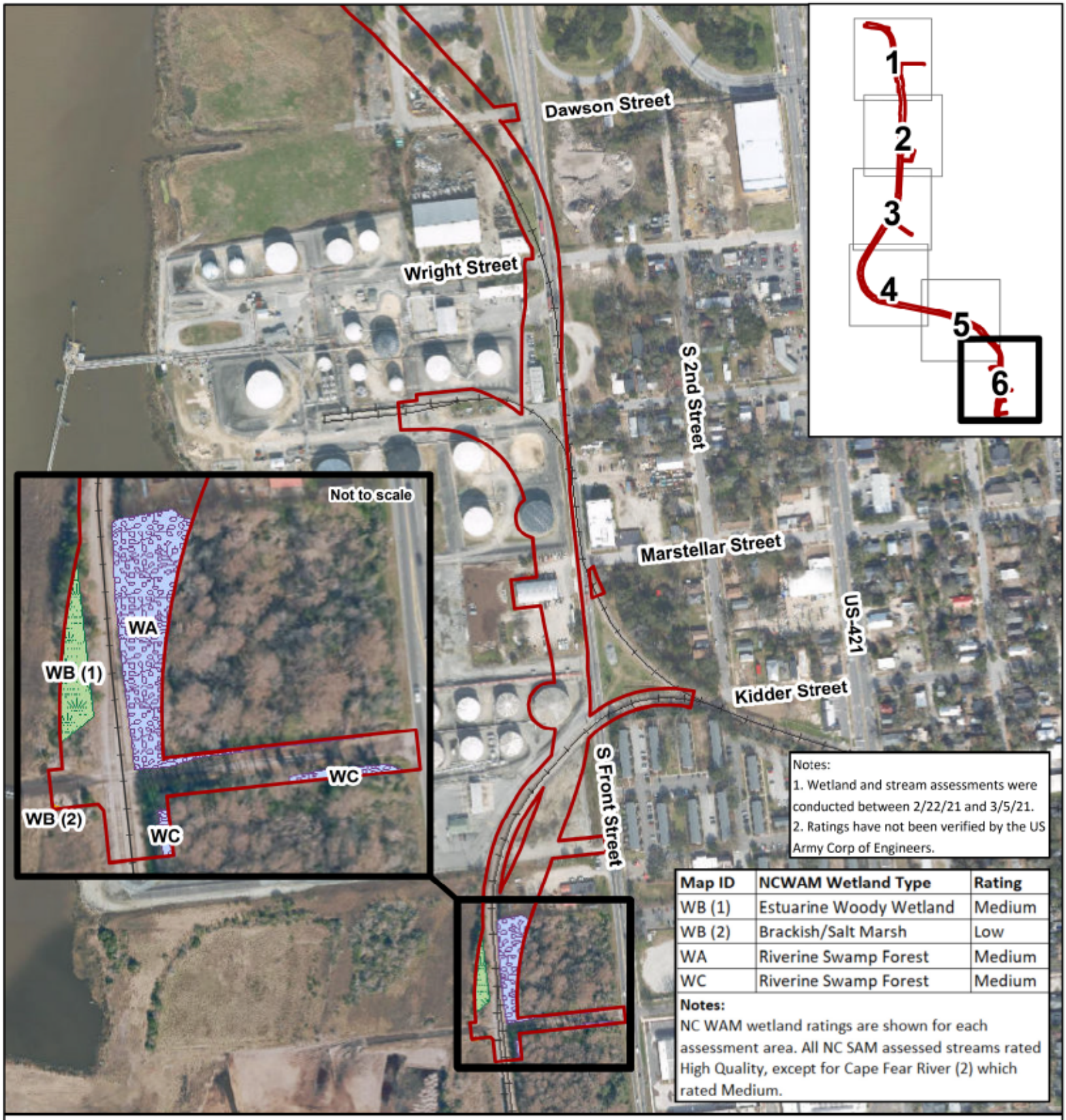
- Riverine Swamp Forest
- Tidal Freshwater Marsh

Figure 9-5
Stream and Wetland Assessment Ratings Map

Date: January 2022

0 0.025 0.05 0.1
Miles

1 inch = 400 feet



Notes:
1. Wetland and stream assessments were conducted between 2/22/21 and 3/5/21.
2. Ratings have not been verified by the US Army Corp of Engineers.

Map ID	NCWAM Wetland Type	Rating
WB (1)	Estuarine Woody Wetland	Medium
WB (2)	Brackish/Salt Marsh	Low
WA	Riverine Swamp Forest	Medium
WC	Riverine Swamp Forest	Medium

Notes:
NC WAM wetland ratings are shown for each assessment area. All NC SAM assessed streams rated High Quality, except for Cape Fear River (2) which rated Medium.

CITY OF WILMINGTON NORTH CAROLINA

Wilmington Rail Realignment Project

New Hanover County and Brunswick County, NC

Source: Esri Aerial Imagery

Legend

- Preferred Alternative Impact Area
- NCSAM Assessed Streams
- Railroad

NCWAM Assessed Wetlands

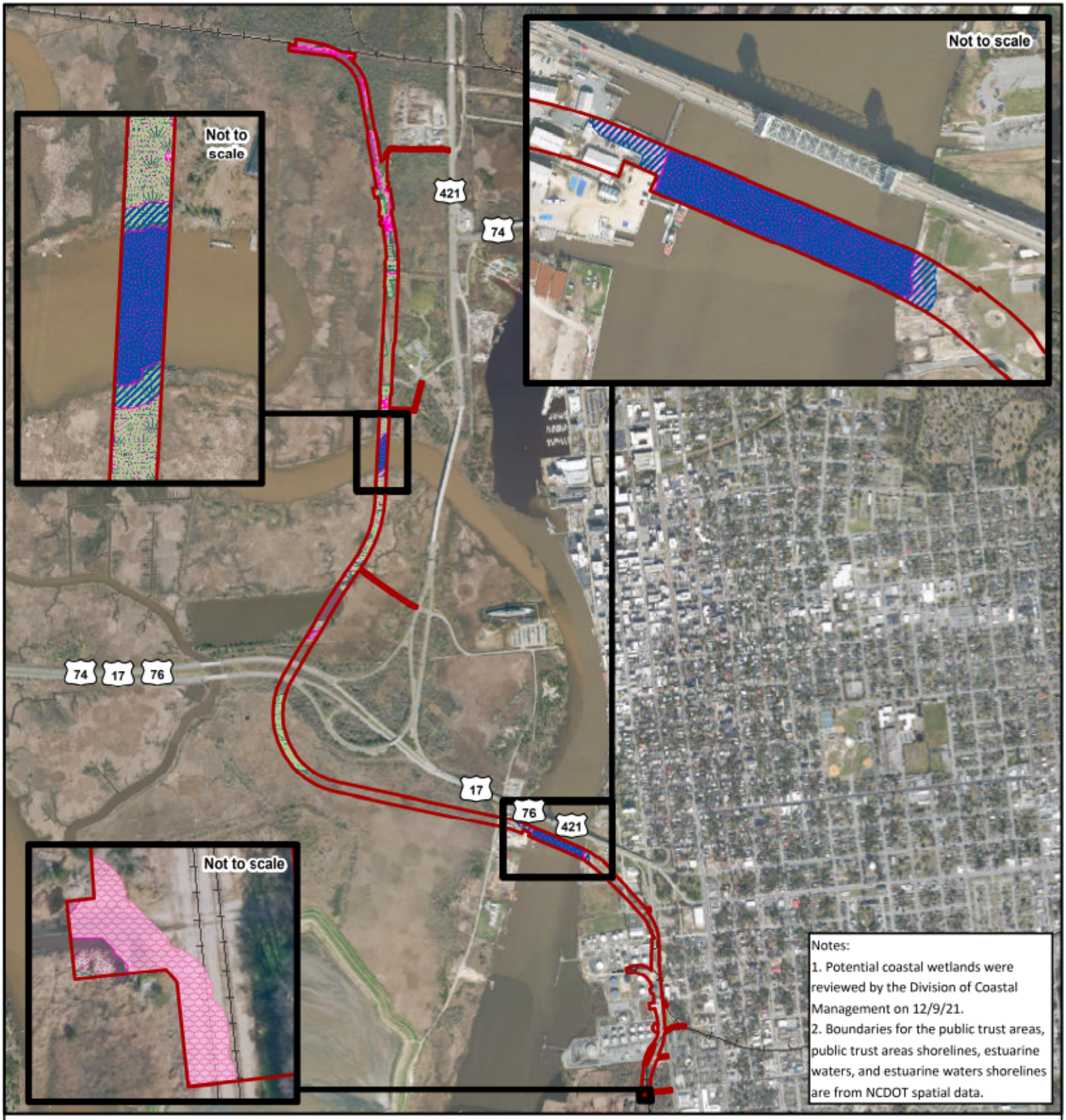
- Brackish/Salt Marsh
- Estuarine Woody Wetland
- Riverine Swamp Forest

Figure 9-6
Stream and Wetland Assessment Ratings Map

Date: January 2022

0 0.025 0.05 0.1
Miles

1 inch = 400 feet



CITY OF WILMINGTON NORTH CAROLINA

Wilmington Rail Realignment Project

New Hanover County and Brunswick County, NC

Source: Esri Aerial Imagery and NCDOT ATLAS

Legend

- Preferred Alternative Impact Area
- Public Trust Areas
- Public Trust Areas Shorelines
- Estuarine Waters
- Estuarine Waters Shorelines
- Coastal Wetlands
- Railroad

Figure 10
Potential Areas of Environmental Concern Map

Date: January 2022

0 0.125 0.25 0.5
Miles
1 inch = 2,000 feet

Appendix B.
Qualifications of Contributors

Appendix B. Qualifications of Contributors

Investigator: Adam Karagosian, PWS
Education: B.S. Environmental Studies, 1993
Experience: Supervising Environmental Scientist, WSP USA, 2014-present
Owner/Principal Scientist, Karagosian Ecological Consulting, 2013-2014
Natural Resources Department Manager, Senior Project Director, WSP Group, 2011-2013
Senior Environmental Scientist, Jacobs Engineering, 2008-2011
Project Environmental Scientist, Senior Scientist, STV/Ralph Whitehead Associates, Inc., 2003-2008
Project Scientist, HDR, Inc. 2002-2003
Project Scientist, Mactec, Inc., 2000-2002
Project Scientist, Staff Scientist S&ME, Inc., 1997-2000
Staff Scientist, B. Laing Associates, Inc., 1994-1996
Responsibilities: Task Lead, project coordination, technical review and QA/QC

Investigator: Amanda Johnson, PWS
Education: B.S. Environmental Science, 2008
M.N.R., 2013
Experience: Lead Consultant, Environmental Scientist, WSP USA, 2019-Present
Biologist II, CZR Incorporated, 2013-2019
Botany Assistant, N.C. Division of Water Quality, 2012
Wetlands Research Intern, N.C. Division of Water Quality, 2011-2012
Responsibilities: Wetland and stream delineation, functional assessments, terrestrial communities assessment, T/E species habitat assessment, document preparation and review

Investigator: Caleb Sullivan, PWS
Education: B.S. Environmental & Natural Resource Economics, 2011
Experience: Environmental Scientist, WSP USA, 2018-Present
Environmental Scientist, Froehling & Robertson, Inc, 2017-2018
Staff Scientist, Carolina Wetland Services, 2016-2017

	Environmental Scientist, Keystone Consultants, 2015-2016 Environmental Scientist, Dieffenbauch & Hritz LLC, 2014-2015 Environmental Technician, Moody & Associates LLC, 2012-2014
Responsibilities:	Wetland and stream delineation, functional assessments, terrestrial communities assessment, T/E species habitat assessment, document preparation and review

Investigator:	Rachel Nangle
Education:	B.S. Environmental Science, 2016
Experience:	Environmental Planner, AECOM, 2016 - Present
Responsibilities:	GIS impact calculations for the impacts assessment (Section 5.0), figures preparation

Appendix C. Terrestrial communties with commonly observed species and location descriptions in the study area

Community	Commonly Observed Species (Scientific name)*	Location in the Study Area	Coverage (ac.)
Maintained/ Disturbed	Loblolly pine (*Pinus taeda*) Red maple (*Acer rubrum*) Sweetgum (*Liquidambar styraciflua*) Chinese privet (*Ligustrum sinense*) Annual bluegrass (*Poa annua*) Common reed (*Phragmites australis*) Fescue (*Festuca sp.*)	Where vegetation is periodically maintained by human influences, including roadside and power line right-of ways, paved areas, and commercial and industrial sites	24.1
Blackwater Bottomland Hardwoods	Laurel-leaf oak (*Quercus laurifolia*) Loblolly pine (*Pinus taeda*) Large-flower magnolia (*Magnolia grandiflora*) Red bay (*Persea palustris*) Red maple (*Acer rubrum*) Sweetbay magnolia (*Magnolia virginiana*) Sweetgum (*Liquidambar styraciflua*) Chinese privet (*Ligustrum sinense*) Japanese privet (*Ligustrum japonicum*) Southern bayberry (*Morella cerifera*) Yaupon holly (*Ilex vomitoria*) Yellow jessamine (*Gelsemium sempervirens*) Common reed (*Phragmites australis*)	High Subtype adjacent to and upslope of marshes	0.8
Brackish Marsh	Salt reedgrass (*Spartina cynosuroides*) Common reed (*Phragmites australis*)	Low marsh areas regularly inundated by the Cape Fear River and/or upper tributaries and channels connected to the Cape Fear River	8.6
Coastal Fringe Evergreen Forest	Eastern red-cedar (*Juniperus virginana*) Loblolly pine (*Pinus taeda*) Red bay (*Persea palustris*) Red maple (*Acer rubrum*) Sweetgum (*Liquidambar styraciflua*) Inkberry (*Ilex glabra*) Southern bayberry (*Morella cerifera*) Yaupon holly (*Ilex vomitoria*) Japanese honeysuckle (*Lonicera japonica*) Saw greenbrier (*Smilax bona-nox*) Yellow jessamine (*Gelsemium sempervirens*) Common reed (*Phragmites australis*) Sedge (*Carex* sp.)	Upland areas near the US 17/US 421 interchange	1.0

Appendix C. Terrestrial communties with commonly observed species and location descriptions in the study area (continued)

Community	Commonly Observed Species (Scientific name)*	Location in the Study Area	Coverage (ac.)
Cypress-Gum Swamp	Bald cypress (*Taxodium distichum*) Red maple (*Acer rubrum*) Swamp blackgum (*Nyssa biflora*) Brookside alder (*Alnus serrulata*) Fetterbush (*Lyonia lucida*) Southern bayberry (*Morella cerifera*) Laurel-leaf greenbrier (*Smilax laurifolia*) Supplejack (*Berchemia scandens*) Sedge (*Carex* sp.) Spikerush (*Eleocharis* sp.)	Floodplains of larger rivers and streams in areas that exhibited evidence of being seasonally to permanently flooded	1.0
Dry-Mesic Oak Hickory	American holly (*Ilex opaca*) Darlington's oak (*Quercus hemisphaerica*) Mockernut hickory (*Carya tomentosa*) Sweetgum (*Liquidambar styraciflua*) Saw greenbrier (*Smilax bona-nox*) Slender spikegrass (*Chasmanthium laxum*)	Upland mounds that exist as a result of an old abandoned railroad bed; surrounded by wetlands	1.4
Estuarine Fringe Pine Forest	Loblolly pine (*Pinus taeda*) Red maple (*Acer rubrum*) Southern bayberry (*Morella cerifera*)	Forested area adjacent to a brackish marsh on the east bank of the Cape Fear River	0.1
Mesic Mixed Hardwood Forest	Red maple (*Acer rubrum*) Sweetgum (*Liquidambar styraciflua*) Tuliptree (*Liriodendron tulipifera*) Chinese privet (*Ligustrum sinense*) Goldenrod (*Solidago* sp.) Small dog-fennel thoroughwort (*Eupatorium capillifolium*)	Moist upland flat slightly upslope from marsh and swamp wetlands and adjacent to maintained/disturbed areas	<0.1
Salt Shrub	Southern bayberry (*Morella cerifera*)	Small area in the middle of the brackish marsh on Eagles Island	0.1
Small Depression Pocosin	Loblolly pine (*Pinus taeda*) Red bay (*Persea palustris*) Red maple (*Acer rubrum*) Sweetbay magnolia (*Magnolia virginiana*)	Small depression surrounded by uplands on an old abandoned railroad bed	<0.1

Appendix C. Terrestrial communties with commonly observed species and location descriptions in the study area (continued)

Community	Commonly Observed Species (Scientific name)*	Location in the Study Area	Coverage (ac.)
Swamp Island Evergreen Forest	American Holly (*Ilex opaca*) Darlington's oak (*Quercus hemisphaerica*) Large-flower magnolia (*Magnolia grandiflora*) Chinese privet (*Ligustrum sinense*) Yaupon holly (*Ilex vomitoria*) Bracken fern (*Pteridium aquilinum*) Common reed (*Phragmites australis*) Old switch panicgrass (*Panicum virgatum*) Switch cane (*Arundinaria gigantea* ssp. *tecta*)	Throughout the study area in the form of upland islands created from power line construction/maintenance and remnant railroad bed	0.4
Tidal Freshwater Marsh	Bushy bluestem (*Andropogon glomeratus*) Cattails (*Typha* spp.) Common reed (*Phragmites australis*) Sedge (*Carex* sp.)	Throughout the study area in locations at slightly higher elevations and/or farther from the tidal channels than the brackish marshes	21.9
Tidal Swamp	Bald cypress (*Taxodium distichum*) Eastern cottonwood (*Populus deltoides*) Red maple (*Acer rubrum*) Swamp blackgum (*Nyssa biflora*) Sweetgum (*Liquidambar styraciflua*) Chinese privet (*Ligustrum sinense*) Eastern baccharis (*Baccharis halimifolia*) Southern bayberry (*Morella cerifera*) Common reed (*Phragmites australis*) Sedge (*Carex* sp.)	Two subtypes: Cypress-Gum Subtype and Mixed Subtype; both adjacent to tidal marshes in areas influenced by fluctuating tide waters	12.9
		Total	**72.2**

*Source for common and scientific names: NatureServe. 2021. NatureServe Explorer [web application]. NatureServe, Arlington, Virginia. https://explorer.natureserve.org/. (Accessed March 25, 2021).

Appendix D.
Scientific Names of Species Identified in Report

Appendix D
Scientific Names of Species Identified in Report

Plants

Common Name	Scientific Name
American elm	*Ulmus americana*
American holly	*Ilex opaca*
Bald cypress	*Taxodium distichum*
Bracken fern	*Pteridium aquilinum*
Bristly sedge	*Carex comosa*
Broadleaf cattail	*Typha latifolia*
Broom-sedge	*Andropogon virginicus*
Brookside alder	*Alnus serrulata*
Bushy bluestem	*Andropogon glomeratus*
Cattails	*Typha* spp.
Chinese privet	*Ligustrum sinense*
Chinese tallowtree	*Triadica sebifera*
Common reed	*Phragmites australis*
Darlington's oak	*Quercus hemisphaerica*
Eastern baccharis	*Baccharis halimifolia*
Eastern cottonwood	*Populus deltoides*
Eastern red-cedar	*Juniperus virginiana*
English ivy	*Hedera helix*
Fescue	*Festuca* sp.
Fetterbush	*Lyonia lucida*
Fringed sedge	*Carex crinata*
Goldenrod	*Solidago* sp.
Inkberry	*Ilex glabra*
Japanese honeysuckle	*Lonicera japonica*
Japanese privet	*Ligustrum sinense*
Japanese stilt grass	*Microstegium vimineum*
Large-flower magnolia	*Magnolia grandiflora*
Laurel-leaf greenbrier	*Smilax laurifolia*
Laurel-leaf oak	*Quercus laurifolia*
Loblolly pine	*Pinus taeda*
Longleaf pine	*Pinus palustris*
Mockernut hickory	*Carya tomentosa*
Narrow-leaved cattail	*Typha angustifolia*
Old switch panicgrass	*Panicum virgatum*
Red bay	*Persea palustris*
Red maple	*Acer rubrum*
Sallow sedge	*Carex lurida*
Salt reedgrass	*Spartina cynosuroides*
Saw greenbrier	*Smilax bona-nox*
Sedge	*Carex* sp.

Plants (continued)

Common Name	Scientific Name
Slender spikegrass	*Chasmanthium taxum*
Small dog-fennel thoroughwort	*Eupatorium capillifolium*
Southern bayberry	*Morella cerifera*
Spikerush	*Eleocharis* sp.
Supplejack	*Berchemia scandens*
Swamp blackgum	*Nyssa biflora*
Sweetbay magnolia	*Magnolia virginiana*
Sweetgum	*Liquidambar styraciflua*
Switch cane	*Arundinaria gigantea* ssp. *tecta*
Tuliptree	*Liriodendron tulipifera*
Tussock sedge	*Carex stricta*
Yaupon holly	*Ilex vomitoria*
Yellow jessamine	*Gelsemium sempervirens*

Animals

Common Name	Scientific Name
American beaver	*Castor canadensis*
American crow	*Corvus brachyrhynchos*
American kestrel	*Falco sparverius paulus*
American oystercatcher	*Haematopus palliatus*
Belted kingfisher	*Megaceryle alcyon*
Black bear	*Ursus americanus*
Black racer	*Coluber constrictor*
Black Skimmer	*Rynchops niger*
Blue jay	*Cyanocitta cristata*
Boat-tailed grackle	*Quiscalus major*
Bobcat	*Lynx rufus*
Bobwhite quail	*Colinus virginianus*
Brown thrasher	*Toxostoma rufum*
Canada goose	*Branta canadensis*
Cardinal	*Cardinalis cardinalis*
Carolina chickadee	*Poecile carolinensis*
Carolina wren	*Thryothorus ludovicianus*
Clapper Rail	*Rallus crepitans*
Common flicker	*Colaptes auratus*
Common grackle	*Quiscalus quiscula*
Cooper's hawk	*Accipiter cooperii*
Copperhead	*Agkistrodon contortrix*
Coyote	*Canis latrans*
Double-crested cormorant	*Phalacrocorax auritus*
Dunlin	*Calidris alpina arcticola*
Eastern bluebird	*Sialia sialis*
Eastern box turtle	*Terrapene carolina*
Eastern cottontail	*Sylvilagus floridanus*

Animals (continued)

Common Name	Scientific Name
Eastern fence lizard	*Sceloporus undulates*
Eastern garter snake	*Thamnophis sirtalis*
Eastern gray squirrel	*Sciurus carolinensis*
Eastern king snake	*Lampropeltis getula*
Fish crow	*Corvus ossifragus*
Five-lined skink	*Eumeces anthracinus*
Gray catbird	*Dumetella carolinensis*
Gray fox	*Urocyon cinereoargenteus*
Great blue heron	*Ardea herodias*
Great egret	*Ardea alba*
Green anole	*Anolis carolinensis*
King Rail	*Rallus elegans*
Least Tern	*Sterna antillarum*
Lesser Yellowlegs	*Tringa flavipes*
Mockingbird	*Mimus polyglottos*
Mourning dove	*Zenaida macroura*
Mud turtle	*Kinosternon subrubrum*
Osprey	*Pandion haliaetus*
Pileated woodpecker	*Hylatomus pileatus*
Prairie Warbler	*Dendroica discolor*
Prothonotary Warbler	*Protonotaria citrea*
Raccoon	*Procyon lotor*
Rat snake	*Pantherophis obsoletus*
Red-bellied woodpecker	*Melanerpes carolinus*
Red-headed woodpecker	*Melanerpes erythrocephalus*
Red-tailed hawk	*Buteo jamaicensis*
Red-winged blackbird	*Agelaius phoeniceus*
Rough green snake	*Opheodrys aestivus*
Rusty Blackbird	*Euphagus carolinus*
Six-lined racerunner	*Aspidoscelis sexlineata*
Snowy egret	*Egretta thula*
Song sparrow	*Melospiza melodia*
Southern toad	*Anaxyrus terrestris*
Spring peeper	*Pseudacris crucifer*
Tufted titmouse	*Baeolophus bicolor*
Turkey vulture	*Cathartes aura*
Virginia opossum	*Didelphis virginiana*
White-tailed deer	*Odocoileus virginianus*
White throated sparrow	*Zonotrichia albicollis*
Wild turkey	*Meleagris gallopavo*
Willet	*Tringa semipalmata*
Wilson's Plover	*Charadrius wilsonia*
Wood Thrush	*Hylocichla mustelina*
Yellow-rumped warbler	*Setophaga coronata*

Appendix E.
Protected Species Information

USFWS Information for Planning and Consultation Official Species List for the Preferred Alternative

NC Natural Heritage Program Reports for the Preferred Alternative

Listed Plant Species Survey Report for the Wilmington Rail Realignment

Black Rail Survey Report for the Wilmington Rail Realignment

Bald Eagle Survey Report for the Wilmington Rail Realignment

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Raleigh Ecological Services Field Office
Post Office Box 33726
Raleigh, NC 27636-3726
Phone: (919) 856-4520 Fax: (919) 856-4556

In Reply Refer To:
Project Code: 2024-0001813
Project Name: Wilmington Rail Realignment

October 05, 2023

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). If your project area contains suitable habitat for any of the federally-listed species on this species list, the proposed action has the potential to adversely affect those species. If suitable habitat is present, surveys should be conducted to determine the species' presence or absence within the project area. The use of this species list and/or North Carolina Natural Heritage program data should not be substituted for actual field surveys.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered

species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see https://www.fws.gov/program/migratory-bird-permit/what-we-do.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/partner/council-conservation-migratory-birds.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Bald & Golden Eagles
- Migratory Birds
- Marine Mammals

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Raleigh Ecological Services Field Office
Post Office Box 33726
Raleigh, NC 27636-3726
(919) 856-4520

PROJECT SUMMARY

Project Code: 2024-0001813
Project Name: Wilmington Rail Realignment
Project Type: Government / Municipal (Non-Military) Construction
Project Description: NEPA document for proposed railroad realignment
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@34.23841185,-77.96224908825901,14z

Counties: Brunswick and New Hanover counties, North Carolina

ENDANGERED SPECIES ACT SPECIES

There is a total of 15 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered
West Indian Manatee *Trichechus manatus* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. ***This species is also protected by the Marine Mammal Protection Act, and may have additional consultation requirements.*** Species profile: https://ecos.fws.gov/ecp/species/4469	Threatened

BIRDS

NAME	STATUS
Piping Plover *Charadrius melodus* Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot *Calidris canutus rufa* There is **proposed** critical habitat for this species. Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened
Red-cockaded Woodpecker *Picoides borealis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7614	Endangered

REPTILES

NAME	STATUS
American Alligator *Alligator mississippiensis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/776	Similarity of Appearance (Threatened)
Green Sea Turtle *Chelonia mydas* Population: North Atlantic DPS There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6199	Threatened
Kemp's Ridley Sea Turtle *Lepidochelys kempii* There is **proposed** critical habitat for this species. Species profile: https://ecos.fws.gov/ecp/species/5523	Endangered
Leatherback Sea Turtle *Dermochelys coriacea* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1493	Endangered
Loggerhead Sea Turtle *Caretta caretta* Population: Northwest Atlantic Ocean DPS There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1110	Threatened

SNAILS

NAME	STATUS
Magnificent Ramshorn *Planorbella magnifica* There is **final** critical habitat for this species. Species profile: https://ecos.fws.gov/ecp/species/6216	Endangered

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

FLOWERING PLANTS

NAME	STATUS
Cooley's Meadowrue *Thalictrum cooleyi* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3281	Endangered
Rough-leaved Loosestrife *Lysimachia asperulaefolia* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2747	Endangered

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

BALD & GOLDEN EAGLES

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act[1] and the Migratory Bird Treaty Act[2].

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

---

1. The Bald and Golden Eagle Protection Act of 1940.
2. The Migratory Birds Treaty Act of 1918.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

There are bald and/or golden eagles in your project area.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Sep 1 to Jul 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read the supplemental information and specifically the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

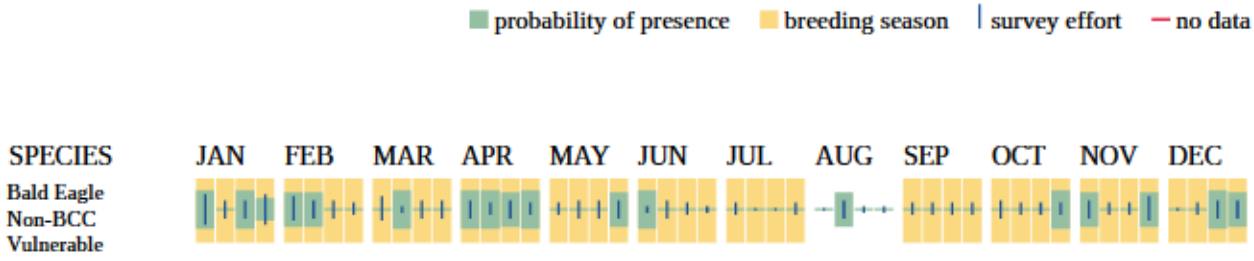
Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Managment https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

MIGRATORY BIRDS

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Kestrel *Falco sparverius paulus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9587	Breeds Apr 1 to Aug 31
American Oystercatcher *Haematopus palliatus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8935	Breeds Apr 15 to Aug 31
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Sep 1 to Jul 31

NAME	BREEDING SEASON
Black Skimmer *Rynchops niger* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/5234	Breeds May 20 to Sep 15
Brown-headed Nuthatch *Sitta pusilla* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds Mar 1 to Jul 15
Chimney Swift *Chaetura pelagica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 25
King Rail *Rallus elegans* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8936	Breeds May 1 to Sep 5
Lesser Yellowlegs *Tringa flavipes* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Painted Bunting *Passerina ciris* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds Apr 25 to Aug 15
Prairie Warbler *Dendroica discolor* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Prothonotary Warbler *Protonotaria citrea* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 1 to Jul 31
Red-headed Woodpecker *Melanerpes erythrocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Rusty Blackbird *Euphagus carolinus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
Saltmarsh Sparrow *Ammodramus caudacutus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9719	Breeds May 15 to Sep 5
Swallow-tailed Kite *Elanoides forficatus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8938	Breeds Mar 10 to Jun 30

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read the supplemental information and specifically the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

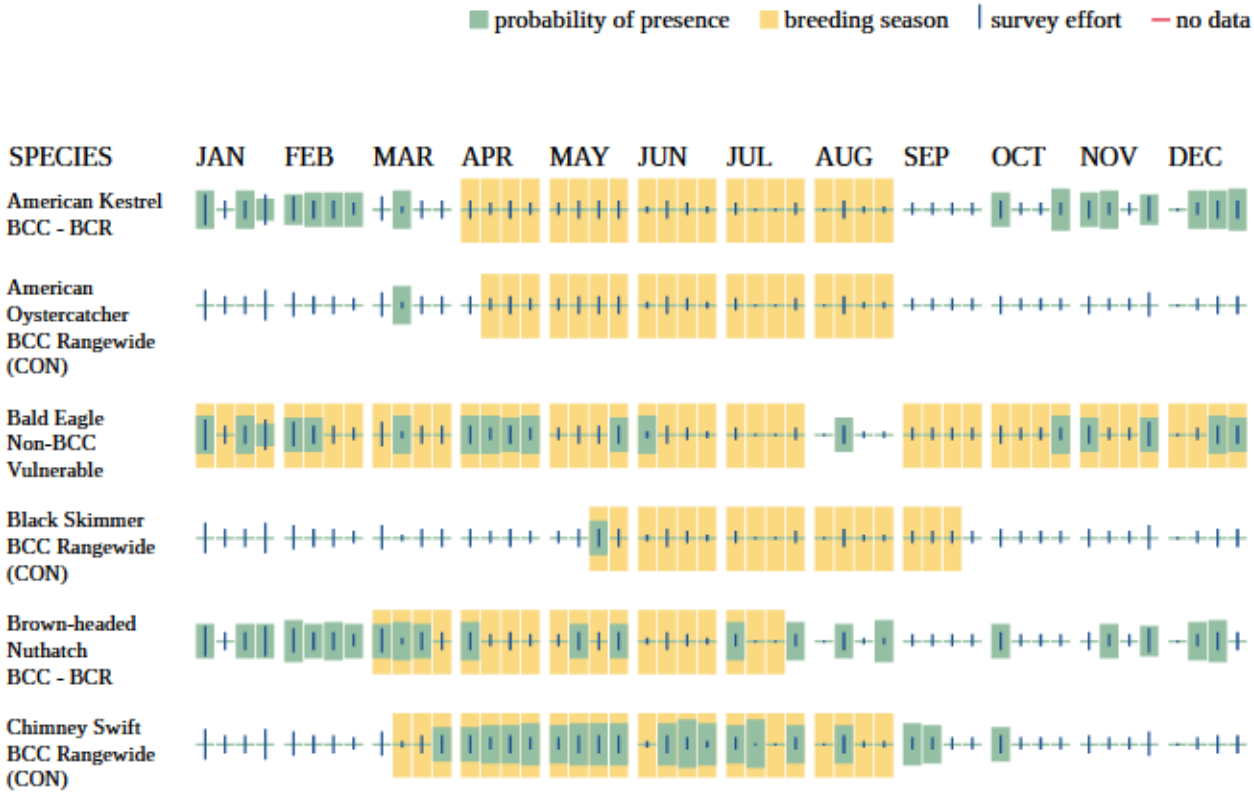
Probability of Presence (▪)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (▪)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

MARINE MAMMALS

Marine mammals are protected under the Marine Mammal Protection Act. Some are also protected under the Endangered Species Act[1] and the Convention on International Trade in Endangered Species of Wild Fauna and Flora[2].

The responsibilities for the protection, conservation, and management of marine mammals are shared by the U.S. Fish and Wildlife Service [responsible for otters, walruses, polar bears, manatees, and dugongs] and NOAA Fisheries[3] [responsible for seals, sea lions, whales, dolphins, and porpoises]. Marine mammals under the responsibility of NOAA Fisheries are **not** shown on this list; for additional information on those species please visit the Marine Mammals page of the NOAA Fisheries website.

The Marine Mammal Protection Act prohibits the take of marine mammals and further coordination may be necessary for project evaluation. Please contact the U.S. Fish and Wildlife Service Field Office shown.

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1. The Endangered Species Act (ESA) of 1973.
2. The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is a treaty to ensure that international trade in plants and animals does not threaten their survival in the wild.
3. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

NAME

West Indian Manatee *Trichechus manatus*

Species profile: https://ecos.fws.gov/ecp/species/4469

IPAC USER CONTACT INFORMATION

Agency: Federal Railroad Administration
Name: Adam Karagosian
Address: 1001 Morehead Square Drive
Address Line 2: Suite 610
City: Charlotte
State: NC
Zip: 28203
Email adam.karagosian@wsp.com
Phone: 7043428464

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Federal Railroad Administration

NC DEPARTMENT OF
NATURAL AND CULTURAL RESOURCES

Roy Cooper, **Governor**

D. Reid Wilson, **Secretary**

Misty Buchanan
Deputy Director, Natural Heritage Program

NCNHDE-23745

October 25, 2023

Adam Karagosian
WSP USA
1001 Morehead Square Drive
Charlotte, NC 28203
RE: Wilmington Rail Realignment; `

Dear Adam Karagosian:

The North Carolina Natural Heritage Program (NCNHP) appreciates the opportunity to provide information about natural heritage resources for the project referenced above.

A query of the NCNHP database indicates that there are records for rare species, important natural communities, natural areas, and/or conservation/managed areas within the proposed project boundary. These results are presented in the attached 'Documented Occurrences' tables and map.

The attached 'Potential Occurrences' table summarizes rare species and natural communities that have been documented within a one-mile radius of the property boundary. The proximity of these records suggests that these natural heritage elements may potentially be present in the project area if suitable habitat exists. Tables of natural areas and conservation/managed areas within a one-mile radius of the project area, if any, are also included in this report.

If a Federally-listed species is documented within the project area or indicated within a one-mile radius of the project area, the NCNHP recommends contacting the US Fish and Wildlife Service (USFWS) for guidance. Contact information for USFWS offices in North Carolina is found here: https://www.fws.gov/offices/Directory/ListOffices.cfm?statecode=37.

Please note that natural heritage element data are maintained for the purposes of conservation planning, project review, and scientific research, and are not intended for use as the primary criteria for regulatory decisions. Information provided by the NCNHP database may not be published without prior written notification to the NCNHP, and the NCNHP must be credited as an information source in these publications. Maps of NCNHP data may not be redistributed without permission.

Also please note that the NC Natural Heritage Program may follow this letter with additional correspondence if a Dedicated Nature Preserve, Registered Heritage Area, Land and Water Fund easement, or an occurrence of a Federally-listed species is documented near the project area.

If you have questions regarding the information provided in this letter or need additional assistance, please contact the NCNHP at natural.heritage@dncr.nc.gov.

Sincerely,
NC Natural Heritage Program

Natural Heritage Element Occurrences, Natural Areas, and Managed Areas Intersecting the Project Area
Wilmington Rail Realignment
Project No. `
October 25, 2023
NCNHDE-23745

Element Occurrences Documented Within Project Area

Taxonomic Group	EO ID	Scientific Name	Common Name	Last Observation Date	Element Occurrence Rank	Accuracy	Federal Status	State Status	Global Rank	State Rank
Bird	27956	Haliaeetus leucocephalus	Bald Eagle	2010	H?	2-High	Bald/Golden Eagle Protection Act	Threatened	G5	S3B,S3N
Butterfly	16102	Problema bulenta	Rare Skipper	1997-08-16	H?	3-Medium	---	Significantly Rare	G3	S1
Freshwater Fish	42816	Heterandria formosa	Least Killifish	1979-10-14	H	3-Medium	---	Special Concern	G5	S2
Natural Community	30742	Tidal Freshwater Marsh (Cattail Subtype)	---	2009-09-29	B	3-Medium	---	---	G4G5	S3
Natural Community	30781	Tidal Freshwater Marsh (Cattail Subtype)	---	2002-06-13	B?	3-Medium	---	---	G4G5	S3
Natural Community	12990	Tidal Freshwater Marsh (Giant Cordgrass Subtype)	---	2002-06-13	B?	3-Medium	---	---	G4	S4
Natural Community	30783	Tidal Freshwater Marsh (Shrub Subtype)	---	2002-06-13	B?	3-Medium	---	---	G4	S4
Natural Community	30745	Tidal Freshwater Marsh (Threesquare Subtype)	---	2009-09-29	B	3-Medium	---	---	G2G3	S2S3
Vascular Plant	26281	Boltonia asteroides var. glastifolia	White Doll's-daisy	1965-09-26	H	3-Medium	---	Significantly Rare Other	G5TNR	S2
Vascular Plant	28150	Oenothera riparia	Riverbank Evening-primrose	2005-08-10	C	3-Medium	---	Significantly Rare Limited	G2G3	S2S3

Natural Areas Documented Within Project Area

Site Name	Representational Rating	Collective Rating
Brunswick River/Cape Fear River Marshes	R1 (Exceptional)	C1 (Exceptional)
CPF/Lower Cape Fear River Aquatic Habitat	R2 (Very High)	C4 (Moderate)

Managed Areas Documented Within Project Area*

Managed Area Name	Owner	Owner Type
NC Department of Transportation Mitigation Site	NC Department of Transportation	State

Managed Areas Documented Within Project Area*

Managed Area Name	Owner	Owner Type
New Hanover County Open Space	New Hanover County	Local Government
New Hanover Soil and Water Conservation District Property	New Hanover Soil and Water Conservation District	Local Government
North Carolina Coastal Land Trust - Royal Preserve	North Carolina Coastal Land Trust	Private
North Carolina Coastal Land Trust Easement	North Carolina Coastal Land Trust	Private
Eagles Island Natural Area Dedicated Nature Preserve	NC DNCR, Natural Heritage Program	State

*NOTE: If the proposed project intersects with a conservation/managed area, please contact the landowner directly for additional information. If the project intersects with a Dedicated Nature Preserve (DNP), Registered Natural Heritage Area (RHA), or Federally-listed species, NCNHP staff may provide additional correspondence regarding the project.

Definitions and an explanation of status designations and codes can be found at https://ncnhde.natureserve.org/help. Data query generated on October 25, 2023; source: NCNHP, Fall (October) 2023. Please resubmit your information request if more than one year elapses before project initiation as new information is continually added to the NCNHP database.

Natural Heritage Element Occurrences, Natural Areas, and Managed Areas Within a One-mile Radius of the Project Area
Wilmington Rail Realignment
Project No. `
October 25, 2023
NCNHDE-23745

Element Occurrences Documented Within a One-mile Radius of the Project Area

Taxonomic Group	EO ID	Scientific Name	Common Name	Last Observation Date	Element Occurrence Rank	Accuracy	Federal Status	State Status	Global Rank	State Rank
Amphibian	37396	Anaxyrus quercicus	Oak Toad	1882-07-22	H	4-Low	---	Significantly Rare	G5	S2
Bird	40201	Ammospiza caudacuta	Saltmarsh Sparrow	2019-04-23	E	3-Medium	---	Significantly Rare	G2	SUB,S2N
Bird	27956	Haliaeetus leucocephalus	Bald Eagle	2010	H?	2-High	Bald/Golden Eagle Protection Act	Threatened	G5	S3B,S3N
Bird	16864	Himantopus mexicanus	Black-necked Stilt	1987	H	4-Low	---	Significantly Rare	G5	S1B
Bird	25229	Ixobrychus exilis	Least Bittern	2002-08	C?	3-Medium	---	Special Concern	G4G5	S3B
Butterfly	40030	Atrytone arogos arogos	Eastern Arogos Skipper	1926-06-17	H	4-Low	---	Significantly Rare	G2G3T1T2	SH
Butterfly	1425	Euphyes dukesi	Dukes' Skipper	2003-05-28	B?	3-Medium	---	Significantly Rare	G3G4	S1S2
Butterfly	16102	Problema bulenta	Rare Skipper	1997-08-16	H?	3-Medium	---	Significantly Rare	G3	S1
Butterfly	6913	Problema bulenta	Rare Skipper	2007-08-12	BC	3-Medium	---	Significantly Rare	G3	S1
Dragonfly or Damselfly	24979	Phanogomphus australis	Clearlake Clubtail	1960-04-24	H	3-Medium	---	Significantly Rare	G4	S2
Dragonfly or Damselfly	33738	Somatochlora georgiana	Coppery Emerald	2004-Pre	H?	5-Very Low	---	Significantly Rare	G3G4	S1?
Freshwater Bivalve	328	Anodonta couperiana	Barrel Floater	1990s	X?	3-Medium	---	Endangered	G4	S1
Freshwater Fish	12176	Acipenser brevirostrum	Shortnose Sturgeon	2016-04-07	E	5-Very Low	Endangered	Endangered	G3	S1
Freshwater Fish	38937	Acipenser oxyrinchus oxyrinchus	Atlantic Sturgeon	2018-09	E	4-Low	Endangered	Endangered	G3T3	S2

Element Occurrences Documented Within a One-mile Radius of the Project Area

Taxonomic Group	EO ID	Scientific Name	Common Name	Last Observation Date	Element Occurrence Rank	Accuracy	Federal Status	State Status	Global Rank	State Rank
Freshwater Fish	42816	Heterandria formosa	Least Killifish	1979-10-14	H	3-Medium	---	Special Concern	G5	S2
Freshwater Fish	11031	Heterandria formosa	Least Killifish	1975-04-04	H	3-Medium	---	Special Concern	G5	S2
Freshwater or Terrestrial Gastropod	13292	Helisoma eucosmium	Greenfield Rams-horn	1908	X	3-Medium	---	Endangered	G1Q	S1
Freshwater or Terrestrial Gastropod	10316	Planorbella magnifica	Magnificent Rams-horn	1908	X	3-Medium	Endangered	Endangered	G1	S1
Mammal	24390	Corynorhinus rafinesquii macrotis	Eastern Big-eared Bat	2006-Pre	E	5-Very Low	---	Special Concern	G3G4T3	S3
Mammal	20385	Lasiurus intermedius floridanus	Florida Yellow Bat	2004-08-14	E	3-Medium	---	Special Concern	G5T4	S1
Moth	26278	Schinia septentrionalis	Northern Flower Moth		H	3-Medium	---	Significantly Rare	G3G4	SH
Natural Community	30746	Brackish Marsh (Smooth Cordgrass Subtype)	---	2009-09-29	B	4-Low	---	---	G3G4	S1
Natural Community	19258	Sand Barren (Typic Subtype)	---	1993-10-12	B	4-Low	---	---	G2	S2
Natural Community	17973	Small Depression Drawdown Meadow (Typic Subtype)	---	1993-10-12	B	3-Medium	---	---	G2?	S2S3
Natural Community	30742	Tidal Freshwater Marsh (Cattail Subtype)	---	2009-09-29	B	3-Medium	---	---	G4G5	S3
Natural Community	30781	Tidal Freshwater Marsh (Cattail Subtype)	---	2002-06-13	B?	3-Medium	---	---	G4G5	S3
Natural Community	18250	Tidal Freshwater Marsh (Giant Cordgrass Subtype)	---	2009-09-29	B	4-Low	---	---	G4	S4
Natural Community	12990	Tidal Freshwater Marsh (Giant Cordgrass Subtype)	---	2002-06-13	B?	3-Medium	---	---	G4	S4

Element Occurrences Documented Within a One-mile Radius of the Project Area

Taxonomic Group	EO ID	Scientific Name	Common Name	Last Observation Date	Element Occurrence Rank	Accuracy	Federal Status	State Status	Global Rank	State Rank
Natural Community	30782	Tidal Freshwater Marsh (Mixed Freshwater Subtype)	---	2002-06-13	B?	4-Low	---	---	G2?	S1
Natural Community	30744	Tidal Freshwater Marsh (Sawgrass Subtype)	---	2009-09-29	B	4-Low	---	---	G4?	S4
Natural Community	30783	Tidal Freshwater Marsh (Shrub Subtype)	---	2002-06-13	B?	3-Medium	---	---	G4	S4
Natural Community	30780	Tidal Freshwater Marsh (Southern Wild Rice Subtype)	---	2002-06-13	B?	4-Low	---	---	G3G5	S4
Natural Community	30745	Tidal Freshwater Marsh (Threesquare Subtype)	---	2009-09-29	B	3-Medium	---	---	G2G3	S2S3
Natural Community	6582	Xeric Sandhill Scrub (Typic Subtype)	---	1985-03	C	4-Low	---	---	G3?	S3S4
Reptile	3970	Alligator mississippiensis	American Alligator	2018-02-26	E	4-Low	Threatened Similar Appearance	Threatened	G5	S3
Reptile	9291	Coluber flagellum flagellum	Eastern Coachwhip	2016-06-22	E	3-Medium	---	Special Concern	G5T5	S2
Reptile	37940	Crotalus adamanteus	Eastern Diamondback Rattlesnake	1924-Pre	H	4-Low	---	Endangered	G3	S1
Reptile	37460	Deirochelys reticularia reticularia	Eastern Chicken Turtle	1957-04	H	4-Low	---	Special Concern	G5T5	S2S3
Reptile	34706	Farancia erytrogramma	Rainbow Snake	2019-05-10	BC	3-Medium	---	Significantly Rare	G4	S3
Reptile	13589	Heterodon simus	Southern Hognose Snake	2009-05-01	D	2-High	---	Threatened	G2	S1S2
Reptile	37611	Heterodon simus	Southern Hognose Snake	1977-06	H	4-Low	---	Threatened	G2	S1S2
Reptile	527	Liodytes rigida	Glossy Crayfish Snake	1962-07-15	H	2-High	---	Significantly Rare	G5	S2
Reptile	216	Malaclemys terrapin	Diamondback Terrapin	2022-05-07	AB	3-Medium	---	Special Concern	G4	S3
Reptile	36989	Micrurus fulvius fulvius	Eastern Coralsnake	1979-05-17	H	4-Low	---	Endangered	G5	S1
Reptile	12976	Ophisaurus mimicus	Mimic Glass Lizard	1967-06-04	H	4-Low	---	Endangered	G2	S1

Element Occurrences Documented Within a One-mile Radius of the Project Area

Taxonomic Group	EO ID	Scientific Name	Common Name	Last Observation Date	Element Occurrence Rank	Accuracy	Federal Status	State Status	Global Rank	State Rank
Reptile	37534	Pituophis melanoleucus melanoleucus	Northern Pinesnake	1924-Pre	H	4-Low	---	Threatened	G4T4	S2
Reptile	16850	Seminatrix pygaea paludis	Carolina Swamp Snake	1963-06-29	H	3-Medium	---	Special Concern	G5T4	S2
Reptile	37561	Sistrurus miliarius miliarius	Carolina Pigmy Rattlesnake	1968-09	H	4-Low	---	Special Concern	G5T4T5	S2
Sawfly, Wasp, Bee, or Ant	40040	Megachile brimleyi	a leafcutter bee	1928-07-21	H	4-Low	---	Significantly Rare	G1G3	SH
Sawfly, Wasp, Bee, or Ant	40042	Megachile deflexa	a leafcutter bee	1932-08-10	H	4-Low	---	Significantly Rare	G2	SH
Sawfly, Wasp, Bee, or Ant	40235	Megachile integra	a leafcutter bee	1948-08-19	H	4-Low	---	Significantly Rare	G2G3	SH
Sawfly, Wasp, Bee, or Ant	40049	Megachile integrella	a leafcutter bee	1952-06-20	H	4-Low	---	Significantly Rare	G1G2	S1S2
Vascular Plant	30852	Baccharis glomeruliflora	Silverling	1904-Pre	H	5-Very Low	---	Endangered	G4	S1
Vascular Plant	26264	Boltonia asteroides var. glastifolia	White Doll's-daisy	2002-06-13	E	4-Low	---	Significantly Rare Other	G5TNR	S2
Vascular Plant	26983	Boltonia asteroides var. glastifolia	White Doll's-daisy	2000-07-18	H?	4-Low	---	Significantly Rare Other	G5TNR	S2
Vascular Plant	26281	Boltonia asteroides var. glastifolia	White Doll's-daisy	1965-09-26	H	3-Medium	---	Significantly Rare Other	G5TNR	S2
Vascular Plant	5040	Carex decomposita	Cypress Knee Sedge	1938-06-29	H	4-Low	---	Significantly Rare Other	G3G4	S2
Vascular Plant	42246	Carex godfreyi	Godfrey's Sedge	Pre-1900	H	5-Very Low	---	Significantly Rare Peripheral	G3G4	S1
Vascular Plant	6571	Crinum americanum var. americanum	Swamp-lily	1975-06-15	H	4-Low	---	Special Concern Historical	G5T5	SH
Vascular Plant	1462	Crocanthemum carolinianum	Carolina Sunrose	1958-04-20	H	4-Low	---	Endangered	G4	S1
Vascular Plant	22454	Dichanthelium cryptanthum	Hidden-flowered Witchgrass	1906-05-04	H	5-Very Low	---	Significantly Rare Throughout	G3Q	S2

Element Occurrences Documented Within a One-mile Radius of the Project Area

Taxonomic Group	EO ID	Scientific Name	Common Name	Last Observation Date	Element Occurrence Rank	Accuracy	Federal Status	State Status	Global Rank	State Rank
Vascular Plant	544	Lilaeopsis carolinensis	Carolina Grasswort	1991-04-26	F	3-Medium	---	Significantly Rare Other	G3G5	S2
Vascular Plant	14082	Lilaeopsis carolinensis	Carolina Grasswort	2002-04-17	C	3-Medium	---	Significantly Rare Other	G3G5	S2
Vascular Plant	28150	Oenothera riparia	Riverbank Evening-primrose	2005-08-10	C	3-Medium	---	Significantly Rare Limited	G2G3	S2S3
Vascular Plant	24757	Peltandra sagittifolia	Spoonflower	2006-10-25	E	3-Medium	---	Significantly Rare Peripheral	G3G4	S2S3
Vascular Plant	3676	Peltandra sagittifolia	Spoonflower	1986-09-19	E	3-Medium	---	Significantly Rare Peripheral	G3G4	S2S3
Vascular Plant	19828	Ptilimnium ahlesii	Carolina Bishopweed	1963-06-29	H	4-Low	---	Significantly Rare Throughout	G1	S1
Vascular Plant	18333	Ptilimnium ahlesii	Carolina Bishopweed	2004-06-10	CD	3-Medium	---	Significantly Rare Throughout	G1	S1
Vascular Plant	8273	Ptilimnium costatum	Ribbed Bishop-weed	1940-10	H	4-Low	---	Threatened	GNR	SH
Vascular Plant	13829	Ptilimnium costatum	Ribbed Bishop-weed	1992-08-07	H?	3-Medium	---	Threatened	GNR	SH

Natural Areas Documented Within a One-mile Radius of the Project Area

Site Name	Representational Rating	Collective Rating
Greenfield Lake	R3 (High)	C5 (General)
Northeast Cape Fear River Floodplain	R1 (Exceptional)	C1 (Exceptional)
Brunswick River/Cape Fear River Marshes	R1 (Exceptional)	C1 (Exceptional)
CPF/Lower Cape Fear River Aquatic Habitat	R2 (Very High)	C4 (Moderate)
421 Sand Ridge	R1 (Exceptional)	C1 (Exceptional)

Managed Areas Documented Within a One-mile Radius of the Project Area

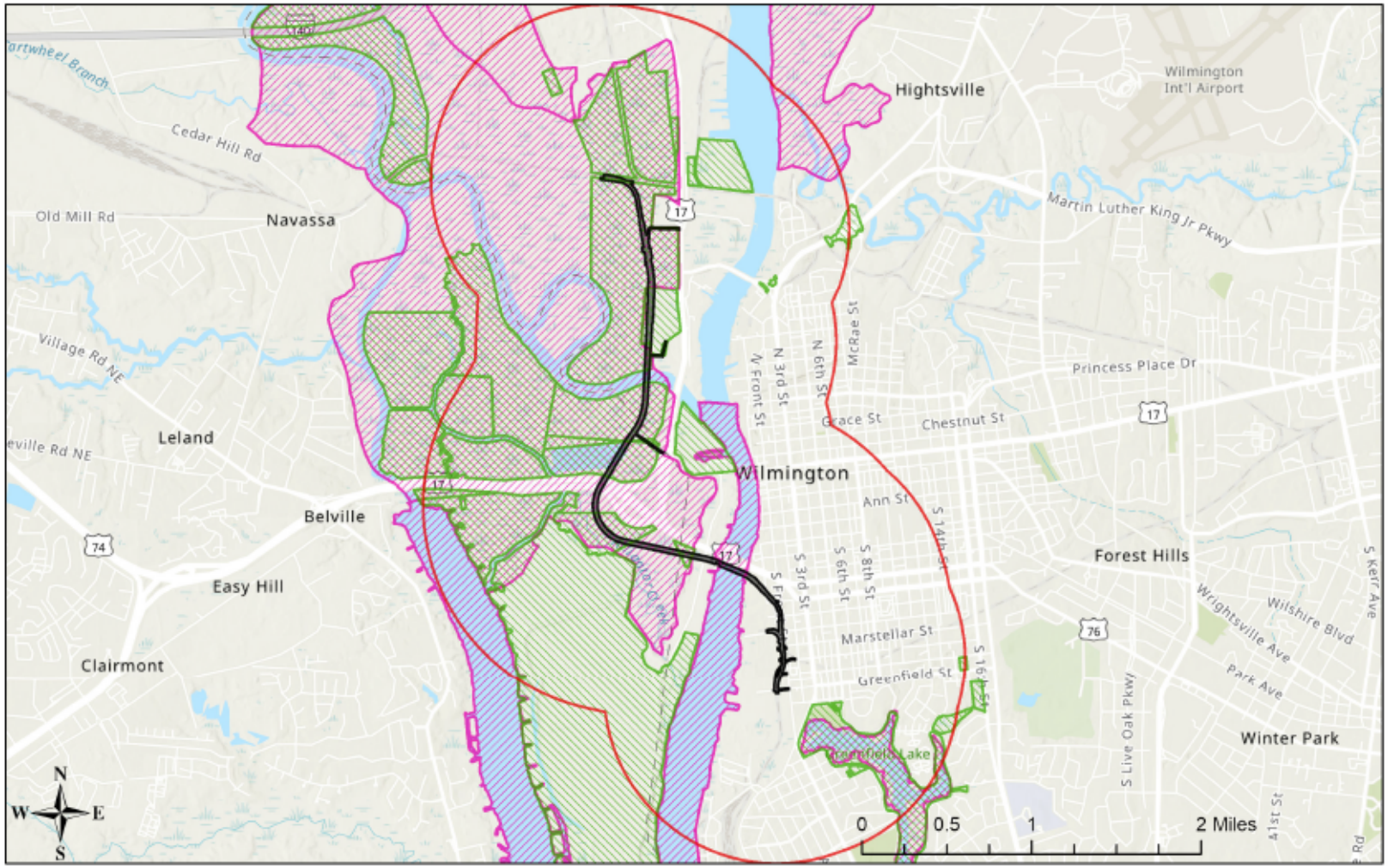
Managed Area Name	Owner	Owner Type
City of Wilmington Open Space	City of Wilmington	Local Government
City of Wilmington Open Space	City of Wilmington	Local Government
Eagles Island Dredge Disposal Area	US Army Corps of Engineers	Federal
Eagles Island Natural Area	NC Department of Agriculture, Division of Soil and Water Conservation	State

Managed Areas Documented Within a One-mile Radius of the Project Area

Managed Area Name	Owner	Owner Type
Eagles Island Spoil Area	NC State Ports Authority	State
NC Department of Transportation Mitigation Site	NC Department of Transportation	State
NC Department of Transportation Mitigation Site	NC Department of Transportation	State
NC Department of Transportation Mitigation Site	NC Department of Transportation	State
New Hanover County Open Space	New Hanover County	Local Government
New Hanover County Open Space	New Hanover County	Local Government
New Hanover County Open Space	New Hanover County	Local Government
New Hanover County Open Space	New Hanover County	Local Government
New Hanover Soil and Water Conservation District Property	New Hanover Soil and Water Conservation District	Local Government
North Carolina Coastal Land Trust - Royal Preserve	North Carolina Coastal Land Trust	Private
USS North Carolina Battleship Memorial	NC DNCR, Division of State Historic Sites and Properties	State
NC Land and Water Fund Conservation Agreement	NC DNCR, NC Land and Water Fund	State
North Carolina Coastal Land Trust Easement	North Carolina Coastal Land Trust	Private
Eagles Island Natural Area Dedicated Nature Preserve	NC DNCR, Natural Heritage Program	State
Eagles Island Natural Area Dedicated Nature Preserve	NC DNCR, Natural Heritage Program	State

Definitions and an explanation of status designations and codes can be found at https://ncnhde.natureserve.org/help. Data query generated on October 25, 2023; source: NCNHP, Fall (October) 2023. Please resubmit your information request if more than one year elapses before project initiation as new information is continually added to the NCNHP database.

NCNHDE-23745: Wilmington Rail Realignment



October 25, 2023

- NHP Natural Area (NHNA)
- Managed Area (MAREA)
- Buffered Project Boundary
- Project Boundary

NC DEPARTMENT OF
NATURAL AND CULTURAL RESOURCES

Roy Cooper, **Governor**

D. Reid Wilson, **Secretary**

Misty Buchanan
Deputy Director, Natural Heritage Program

NCNHDE-16645

December 28, 2021

Adam Karagosian
WSP USA
1001 Morehead Square Drive
Charlotte, NC 28203
RE: WRR Preferred Alternative

Dear Adam Karagosian:

The North Carolina Natural Heritage Program (NCNHP) appreciates the opportunity to provide information about natural heritage resources for the project referenced above.

A query of the NCNHP database indicates that there are records for rare species, important natural communities, natural areas, and/or conservation/managed areas within the proposed project boundary. These results are presented in the attached 'Documented Occurrences' tables and map.

The attached 'Potential Occurrences' table summarizes rare species and natural communities that have been documented within a one-mile radius of the property boundary. The proximity of these records suggests that these natural heritage elements may potentially be present in the project area if suitable habitat exists. Tables of natural areas and conservation/managed areas within a one-mile radius of the project area, if any, are also included in this report.

If a Federally-listed species is documented within the project area or indicated within a one-mile radius of the project area, the NCNHP recommends contacting the US Fish and Wildlife Service (USFWS) for guidance. Contact information for USFWS offices in North Carolina is found here: https://www.fws.gov/offices/Directory/ListOffices.cfm?statecode=37.

Please note that natural heritage element data are maintained for the purposes of conservation planning, project review, and scientific research, and are not intended for use as the primary criteria for regulatory decisions. Information provided by the NCNHP database may not be published without prior written notification to the NCNHP, and the NCNHP must be credited as an information source in these publications. Maps of NCNHP data may not be redistributed without permission.

Also please note that the NC Natural Heritage Program may follow this letter with additional correspondence if a Dedicated Nature Preserve, Registered Heritage Area, Land and Water Fund easement, or an occurrence of a Federally-listed species is documented near the project area.

If you have questions regarding the information provided in this letter or need additional assistance, please contact Rodney A. Butler at rodney.butler@ncdcr.gov or 919-707-8603.

Sincerely,
NC Natural Heritage Program

Natural Heritage Element Occurrences, Natural Areas, and Managed Areas Intersecting the Project Area
WRR Preferred Alternative
December 28, 2021
NCNHDE-16645

Element Occurrences Documented Within Project Area

Taxonomic Group	EO ID	Scientific Name	Common Name	Last Observation Date	Element Occurrence Rank	Accuracy	Federal Status	State Status	Global Rank	State Rank
Bird	27956	Haliaeetus leucocephalus	Bald Eagle	2010	H?	2-High	Bald/Golden Eagle Protection Act	Threatened	G5	S3B,S3N
Natural Community	30742	Tidal Freshwater Marsh (Cattail Subtype)	---	2009-09-29	B	3-Medium	---	---	G4G5	S3
Natural Community	30781	Tidal Freshwater Marsh (Cattail Subtype)	---	2002-06-13	B?	3-Medium	---	---	G4G5	S3
Natural Community	12990	Tidal Freshwater Marsh (Giant Cordgrass Subtype)	---	2002-06-13	B?	3-Medium	---	---	G4	S4
Natural Community	30783	Tidal Freshwater Marsh (Shrub Subtype)	---	2002-06-13	B?	3-Medium	---	---	G4	S4
Natural Community	30745	Tidal Freshwater Marsh (Threesquare Subtype)	---	2009-09-29	B	3-Medium	---	---	G2G3	S2S3
Vascular Plant	26281	Boltonia asteroides var. glastifolia	White Doll's-daisy	1965-09-26	H	3-Medium	---	Significantly Rare Other	G5TNR	S2
Vascular Plant	28150	Oenothera riparia	Riverbank Evening-primrose	2005-08-10	C	3-Medium	---	Significantly Rare Limited	G2G3	S2S3

Natural Areas Documented Within Project Area

Site Name	Representational Rating	Collective Rating
Brunswick River/Cape Fear River Marshes	R1 (Exceptional)	C2 (Very High)
CPF/Lower Cape Fear River Aquatic Habitat	R2 (Very High)	C4 (Moderate)

Managed Areas Documented Within Project Area*

Managed Area Name	Owner	Owner Type
North Carolina Coastal Land Trust - Royal Preserve	North Carolina Coastal Land Trust	Private
New Hanover Soil and Water Conservation District Property	New Hanover Soil and Water Conservation District	Local Government
North Carolina Coastal Land Trust Easement	North Carolina Coastal Land Trust	Private
Eagles Island Natural Area Dedicated Nature Preserve	New Hanover Soil and Water Conservation District	State

Managed Areas Documented Within Project Area*

Managed Area Name	Owner	Owner Type
NC Division of Mitigation Services Easement	NC Department of Transportation	State
USS North Carolina Battleship Memorial	NC DNCR, Division of State Historic Sites and Properties	State
New Hanover County Open Space	New Hanover County	Local Government

*NOTE: If the proposed project intersects with a conservation/managed area, please contact the landowner directly for additional information. If the project intersects with a Dedicated Nature Preserve (DNP), Registered Natural Heritage Area (RHA), or Federally-listed species, NCNHP staff may provide additional correspondence regarding the project.

Definitions and an explanation of status designations and codes can be found at https://ncnhde.natureserve.org/help. Data query generated on December 28, 2021; source: NCNHP, Q3 October 2021. Please resubmit your information request if more than one year elapses before project initiation as new information is continually added to the NCNHP database.

Natural Heritage Element Occurrences, Natural Areas, and Managed Areas Within a One-mile Radius of the Project Area
WRR Preferred Alternative
December 28, 2021
NCNHDE-16645

Element Occurrences Documented Within a One-mile Radius of the Project Area

Taxonomic Group	EO ID	Scientific Name	Common Name	Last Observation Date	Element Occurrence Rank	Accuracy	Federal Status	State Status	Global Rank	State Rank
Amphibian	37396	Anaxyrus quercicus	Oak Toad	1882-07-22	H	4-Low	---	Significantly Rare	G5	S2
Bird	40201	Ammospiza caudacuta	Saltmarsh Sparrow	2019-04-23	E	3-Medium	---	Significantly Rare	G2	SUB,S2N
Bird	27956	Haliaeetus leucocephalus	Bald Eagle	2010	H?	2-High	Bald/Golden Eagle Protection Act	Threatened	G5	S3B,S3N
Bird	16864	Himantopus mexicanus	Black-necked Stilt	1987	H	4-Low	---	Significantly Rare	G5	S1B
Bird	25229	Ixobrychus exilis	Least Bittern	2002-08	C?	3-Medium	---	Special Concern	G4G5	S2S3B
Butterfly	40030	Atrytone arogos arogos	Eastern Arogos Skipper	1926-06-17	H	4-Low	---	Significantly Rare	G2G3T1T2	SH
Butterfly	1425	Euphyes dukesi	Dukes' Skipper	2003-05-28	B?	3-Medium	---	Significantly Rare	G3G4	S1S2
Butterfly	16102	Problema bulenta	Rare Skipper	1997-08-16	H?	4-Low	---	Significantly Rare	G3	S1
Butterfly	6913	Problema bulenta	Rare Skipper	2007-08-12	BC	3-Medium	---	Significantly Rare	G3	S1
Dragonfly or Damselfly	24979	Phanogomphus australis	Clearlake Clubtail	1960-04-24	H	3-Medium	---	Significantly Rare	G4	S2
Dragonfly or Damselfly	33738	Somatochlora georgiana	Coppery Emerald	2004-Pre	H?	5-Very Low	---	Significantly Rare	G3G4	S1?
Freshwater Bivalve	328	Anodonta couperiana	Barrel Floater	1990s	X?	3-Medium	---	Endangered	G4	S1
Freshwater Fish	12176	Acipenser brevirostrum	Shortnose Sturgeon	2016-04-07	E	5-Very Low	Endangered	Endangered	G3	S1
Freshwater Fish	38937	Acipenser oxyrinchus oxyrinchus	Atlantic Sturgeon	2018-09	E	4-Low	Endangered	Endangered	G3T3	S2
Freshwater Fish	11031	Heterandria formosa	Least Killifish	1975-04-04	H	3-Medium	---	Special Concern	G5	S2

Element Occurrences Documented Within a One-mile Radius of the Project Area

Taxonomic Group	EO ID	Scientific Name	Common Name	Last Observation Date	Element Occurrence Rank	Accuracy	Federal Status	State Status	Global Rank	State Rank
Freshwater or Terrestrial Gastropod	13292	Helisoma eucosmium	Greenfield Rams-horn	1908	X	3-Medium	---	Endangered	G1Q	S1
Freshwater or Terrestrial Gastropod	10316	Planorbella magnifica	Magnificent Rams-horn	1908	X	3-Medium	Candidate	Endangered	G1	S1
Mammal	24390	Corynorhinus rafinesquii macrotis	Eastern Big-eared Bat	2006-Pre	E	5-Very Low	---	Special Concern	G3G4T3	S3
Mammal	20385	Lasiurus intermedius floridanus	Florida Yellow Bat	2004-08-14	E	3-Medium	---	Special Concern	G5T4	S1
Mammal	32126	Myotis septentrionalis	Northern Long-eared Bat	1994-Post	H?	5-Very Low	Threatened	Threatened	G1G2	S2
Mammal	17664	Trichechus manatus	West Indian Manatee	2019-11-14	E	5-Very Low	Threatened	Threatened	G2G3	S1N
Moth	26278	Schinia septentrionalis	Northern Flower Moth		H	3-Medium	---	Significantly Rare	G3G4	SH
Natural Community	30746	Brackish Marsh (Smooth Cordgrass Subtype)	---	2009-09-29	B	4-Low	---	---	G3G4	S1
Natural Community	19258	Sand Barren (Typic Subtype)	---	1993-10-12	B	4-Low	---	---	G2	S2
Natural Community	17973	Small Depression Drawdown Meadow (Typic Subtype)	---	1993-10-12	B	3-Medium	---	---	G2?	S2S3
Natural Community	30742	Tidal Freshwater Marsh (Cattail Subtype)	---	2009-09-29	B	3-Medium	---	---	G4G5	S3
Natural Community	30781	Tidal Freshwater Marsh (Cattail Subtype)	---	2002-06-13	B?	3-Medium	---	---	G4G5	S3
Natural Community	18250	Tidal Freshwater Marsh (Giant Cordgrass Subtype)	---	2009-09-29	B	4-Low	---	---	G4	S4
Natural Community	12990	Tidal Freshwater Marsh (Giant Cordgrass Subtype)	---	2002-06-13	B?	3-Medium	---	---	G4	S4

Element Occurrences Documented Within a One-mile Radius of the Project Area

Taxonomic Group	EO ID	Scientific Name	Common Name	Last Observation Date	Element Occurrence Rank	Accuracy	Federal Status	State Status	Global Rank	State Rank
Natural Community	30782	Tidal Freshwater Marsh (Mixed Freshwater Subtype)	---	2002-06-13	B?	4-Low	---	---	G2?	S1
Natural Community	30744	Tidal Freshwater Marsh (Sawgrass Subtype)	---	2009-09-29	B	4-Low	---	---	G4?	S4
Natural Community	30783	Tidal Freshwater Marsh (Shrub Subtype)	---	2002-06-13	B?	3-Medium	---	---	G4	S4
Natural Community	30780	Tidal Freshwater Marsh (Southern Wild Rice Subtype)	---	2002-06-13	B?	4-Low	---	---	G3G5	S4
Natural Community	30745	Tidal Freshwater Marsh (Threesquare Subtype)	---	2009-09-29	B	3-Medium	---	---	G2G3	S2S3
Natural Community	6582	Xeric Sandhill Scrub (Typic Subtype)	---	1985-03	C	4-Low	---	---	G3?	S3S4
Reptile	3970	Alligator mississippiensis	American Alligator	2018-02-26	E	4-Low	Threatened Similar Appearance	Threatened	G5	S3
Reptile	37940	Crotalus adamanteus	Eastern Diamondback Rattlesnake	1924-Pre	H	4-Low	---	Endangered	G3	S1
Reptile	37460	Deirochelys reticularia reticularia	Eastern Chicken Turtle	1957-04	H	4-Low	---	Special Concern	G5T5	S2S3
Reptile	34706	Farancia erytrogramma	Rainbow Snake	2019-05-10	BC	3-Medium	---	Significantly Rare	G4	S3
Reptile	13589	Heterodon simus	Southern Hognose Snake	2009-05-01	D	2-High	---	Threatened	G2	S1S2
Reptile	37611	Heterodon simus	Southern Hognose Snake	1977-06	H	4-Low	---	Threatened	G2	S1S2
Reptile	527	Liodytes rigida	Glossy Crayfish Snake	1962-07-15	H	2-High	---	Significantly Rare	G5	S2
Reptile	216	Malaclemys terrapin	Diamondback Terrapin	2019-05-19	AB	3-Medium	---	Special Concern	G4	S3
Reptile	9291	Masticophis flagellum	Coachwhip	2016-06-22	E	3-Medium	---	Significantly Rare	G5	S2
Reptile	36989	Micrurus fulvius fulvius	Eastern Coralsnake	1979-05-17	H	4-Low	---	Endangered	G5	S1
Reptile	12976	Ophisaurus mimicus	Mimic Glass Lizard	1967-06-04	H	4-Low	---	Special Concern	G3	S1

Element Occurrences Documented Within a One-mile Radius of the Project Area

Taxonomic Group	EO ID	Scientific Name	Common Name	Last Observation Date	Element Occurrence Rank	Accuracy	Federal Status	State Status	Global Rank	State Rank
Reptile	37534	Pituophis melanoleucus melanoleucus	Northern Pinesnake	1924-Pre	H	4-Low	---	Threatened	G4T4	S2
Reptile	16850	Seminatrix pygaea paludis	Carolina Swamp Snake	1963-06-29	H	3-Medium	---	Special Concern	G5T4	S2
Reptile	37561	Sistrurus miliarius miliarius	Carolina Pigmy Rattlesnake	1968-09	H	4-Low	---	Special Concern	G5T4T5	S2
Sawfly, Wasp, Bee, or Ant	40040	Megachile brimleyi	a leafcutter bee	1928-07-21	H	4-Low	---	Significantly Rare	G1G3	SH
Sawfly, Wasp, Bee, or Ant	40042	Megachile deflexa	a leafcutter bee	1932-08-10	H	4-Low	---	Significantly Rare	G2	SH
Sawfly, Wasp, Bee, or Ant	40235	Megachile integra	a leafcutter bee	1948-08-19	H	4-Low	---	Significantly Rare	G2G3	SH
Sawfly, Wasp, Bee, or Ant	40049	Megachile integrella	a leafcutter bee	1952-06-20	H	4-Low	---	Significantly Rare	G1G2	S1S2
Vascular Plant	30852	Baccharis glomeruliflora	Silverling	1904-Pre	H	5-Very Low	---	Endangered	G4	S1
Vascular Plant	26264	Boltonia asteroides var. glastifolia	White Doll's-daisy	2002-06-13	E	4-Low	---	Significantly Rare Other	G5TNR	S2
Vascular Plant	26983	Boltonia asteroides var. glastifolia	White Doll's-daisy	2000-07-18	H?	4-Low	---	Significantly Rare Other	G5TNR	S2
Vascular Plant	26281	Boltonia asteroides var. glastifolia	White Doll's-daisy	1965-09-26	H	3-Medium	---	Significantly Rare Other	G5TNR	S2
Vascular Plant	5040	Carex decomposita	Cypress Knee Sedge	1938-06-29	H	4-Low	---	Significantly Rare Other	G3G4	S2
Vascular Plant	6571	Crinum americanum var. americanum	Swamp-lily	1975-06-15	H	4-Low	---	Special Concern Historical	G5T5	SH
Vascular Plant	1462	Crocanthemum carolinianum	Carolina Sunrose	1958-04-20	H	4-Low	---	Endangered	G4	S1
Vascular Plant	22454	Dichanthelium cryptanthum	Hidden-flowered Witchgrass	1906-05-04	H	5-Very Low	---	Significantly Rare Throughout	G3G4Q	S2
Vascular Plant	14082	Lilaeopsis carolinensis	Carolina Grasswort	2002-04-17	AB	3-Medium	---	Significantly Rare Other	G3G5	S2

Element Occurrences Documented Within a One-mile Radius of the Project Area

Taxonomic Group	EO ID	Scientific Name	Common Name	Last Observation Date	Element Occurrence Rank	Accuracy	Federal Status	State Status	Global Rank	State Rank
Vascular Plant	544	Lilaeopsis carolinensis	Carolina Grasswort	1991-04-26	F	3-Medium	---	Significantly Rare Other	G3G5	S2
Vascular Plant	28150	Oenothera riparia	Riverbank Evening-primrose	2005-08-10	C	3-Medium	---	Significantly Rare Limited	G2G3	S2S3
Vascular Plant	24757	Peltandra sagittifolia	Spoonflower	2006-10-25	E	3-Medium	---	Significantly Rare Peripheral	G3G4	S2S3
Vascular Plant	3676	Peltandra sagittifolia	Spoonflower	1986-09-19	E	3-Medium	---	Significantly Rare Peripheral	G3G4	S2S3
Vascular Plant	19828	Ptilimnium ahlesii	Carolina Bishopweed	1963-06-29	H	4-Low	---	Significantly Rare Throughout	G1	S1
Vascular Plant	18333	Ptilimnium ahlesii	Carolina Bishopweed	2004-06-10	CD	3-Medium	---	Significantly Rare Throughout	G1	S1
Vascular Plant	8273	Ptilimnium costatum	Ribbed Bishop-weed	1940-10	H	4-Low	---	Threatened	GNR	S1
Vascular Plant	13829	Ptilimnium costatum	Ribbed Bishop-weed	1992-08-07	A	3-Medium	---	Threatened	GNR	S1

Natural Areas Documented Within a One-mile Radius of the Project Area

Site Name	Representational Rating	Collective Rating
Greenfield Lake	R3 (High)	C5 (General)
Northeast Cape Fear River Floodplain	R1 (Exceptional)	C1 (Exceptional)
Brunswick River/Cape Fear River Marshes	R1 (Exceptional)	C2 (Very High)
CPF/Lower Cape Fear River Aquatic Habitat	R2 (Very High)	C4 (Moderate)
421 Sand Ridge	R1 (Exceptional)	C1 (Exceptional)

Managed Areas Documented Within a One-mile Radius of the Project Area

Managed Area Name	Owner	Owner Type
Eagles Island Dredge Disposal Area	US Army Corps of Engineers	Federal
North Carolina Coastal Land Trust - Royal Preserve	North Carolina Coastal Land Trust	Private
New Hanover Soil and Water Conservation District Property	New Hanover Soil and Water Conservation District	Local Government
North Carolina Coastal Land Trust Easement	North Carolina Coastal Land Trust	Private
City of Wilmington Open Space	City of Wilmington	Local Government

Managed Areas Documented Within a One-mile Radius of the Project Area

Managed Area Name	Owner	Owner Type
Eagles Island Natural Area Dedicated Nature Preserve	NC Department of Agriculture, Division of Soil and Water Conservation	State
Eagles Island Natural Area	NC Department of Agriculture, Division of Soil and Water Conservation	State
NC Land and Water Fund Conservation Agreement	NC DNCR, NC Land and Water Fund	State
City of Wilmington Open Space	City of Wilmington	Local Government
Eagles Island Natural Area Dedicated Nature Preserve	New Hanover Soil and Water Conservation District	State
NC Division of Mitigation Services Easement	NC Department of Transportation	State
Eagles Island Spoil Area	NC State Ports Authority	State
USS North Carolina Battleship Memorial	NC DNCR, Division of State Historic Sites and Properties	State
New Hanover County Open Space	New Hanover County	Local Government
New Hanover County Open Space	New Hanover County	Local Government
NC Department of Transportation Mitigation Site	NC Department of Transportation	State
New Hanover County Open Space	New Hanover County	Local Government
New Hanover County Open Space	New Hanover County	Local Government
NC Department of Transportation Mitigation Site	NC Department of Transportation	State

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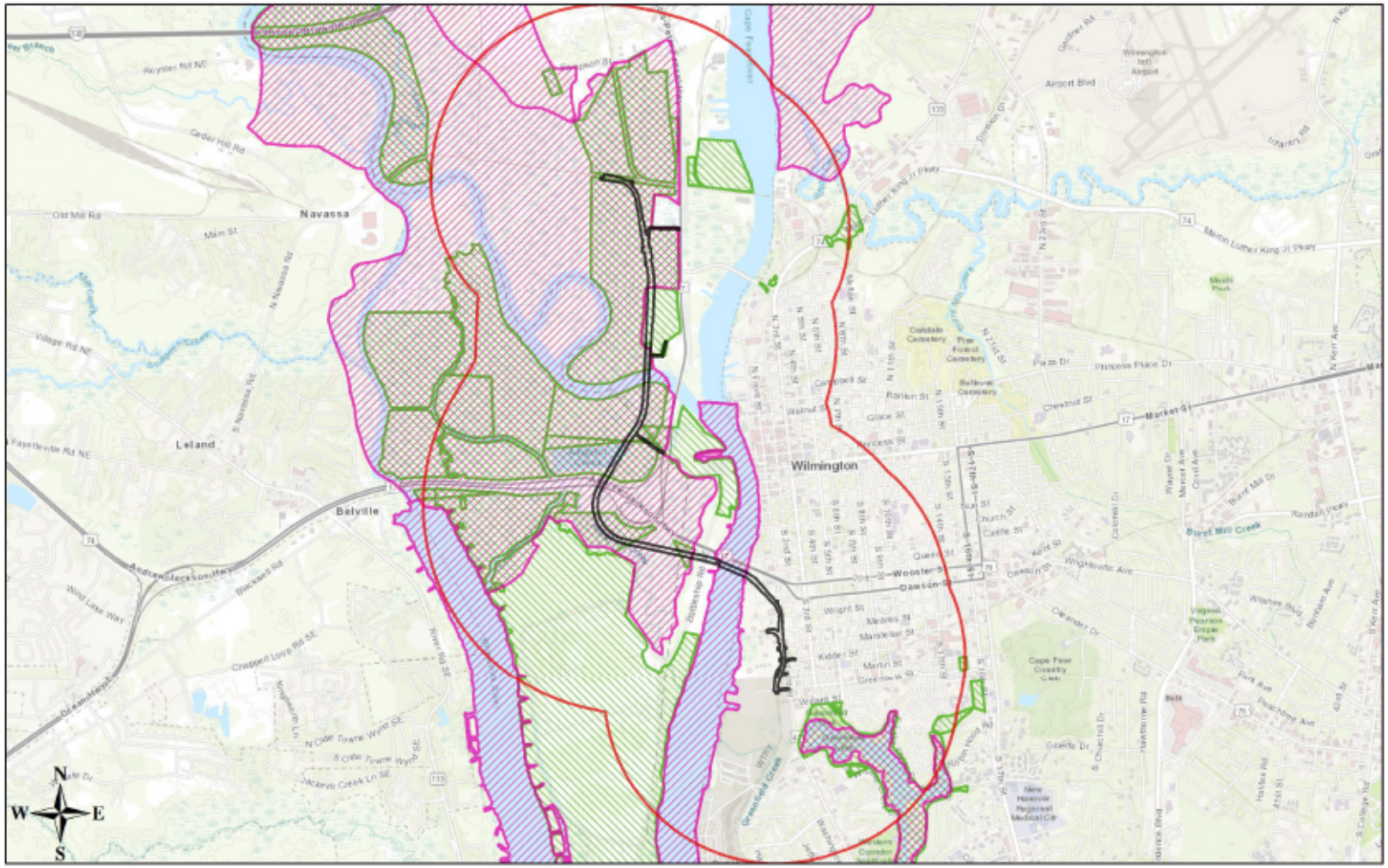
NCNHDE-16645: WRR Preferred Alternative



December 28, 2021

- Project Boundary
- Buffered Project Boundary
- NHP Natural Area (NHNA)
- Managed Area (MAREA)

1:51,425

0 0.425 0.85 1.7 mi

0 0.5 1 2 km

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

DIAL CORDY
AND ASSOCIATES INC
Environmental Consultants

201 N. Front Street, Suite 307
Wilmington, NC 28401
(910) 251-9790

24 August, 2021

Jeff Mann
Project Manager
AECOM
201 N. Front Street
Suite 509
Wilmington, NC 28401

Re: City of Wilmington Rail Realignment Rail EA – Listed Plant Species Survey

Dear Mr. Mann:

Dial Cordy and Associates Inc. (DCA) has completed the federally listed plant species survey and habitat assessment for the identified area of potentially suitable habitat along US 421 in Brunswick County (Figure 1). A survey and habitat suitability assessment for Cooley's Meadowrue (*Thalictrum cooleyi*), golden sedge (*Carex lutea*), and rough-leaved loosestrife (*Lysimachia asperulifolia*) was conducted by DCA staff Rahlff Ingle (MS Botany NCSU) and James Hargrove on 8 April 2021. No occurrences of listed plant species were encountered during the survey. Furthermore, based on the habitat assessment provided below, the assessment area does not contain suitable habitat for any of the listed plant species.

Habitat Assessment

The assessment area is located along the western margin of US 421 on the tidal floodplain of the Cape Fear River. Soils are mapped by the NRCS as Chowan silt loam. Tidal hydrology has been modified by filling and grading, including the construction of an elevated road bed/powerline corridor that bisects the site. The site contains a disturbed supratidal to non-tidal swamp forest community with an open canopy of red maple (*Acer rubrum*), sweet-gum (*Liquidambar styraciflua*), swamp tupelo (*Nyssa biflora*), and eastern cottonwood (*Populus deltoides*). The very dense to moderately dense shrub layer is dominated by Chinese privet (*Ligustrum sinense*), sweetgum, Chinese tallow-tree (*Triadica sebifera*), wax myrtle (*Morella cerifera*), and silverling (*Baccharis halimifolia*). The sparse groundcover stratum is dominated by Japanese stilt-grass (*Microstegium vimineum*) and woody vines such as poison ivy (*Toxicodendron radicans*),

honeysuckle (*Lonicera japonica*), and Virginia creeper (*Parthenocisus quinquefolia*). Known occurrences of Cooley's meadowrue and golden sedge are associated with ecotones between fire-maintained pine savannas and non-riverine swamp forests; including powerline corridors where the typical assemblage of savanna herbaceous species is maintained by mowing (Suiter and LeBlond 2014). Similarly, rough-leaved loosestrife is associated with ecotones between longleaf pine savannas and pocosin communities; including roadside depressions and powerline corridors where the typical assemblage of savanna herbaceous species is maintained by artificial disturbance (Suiter 2014). The tidal floodplain habitats of the assessment area do not constitute suitable habitat for any of these species.

Regards,

R Steve Dial

R Steve Dial
President

Figure 1. Assessment Area.

201 N. Front Street,
Wilmington, NC
(910) 251-9790 Fax

DIAL CORDY
AND ASSOCIATES INC
Environmental Consultants

Suite 307
238401
(910) 251-9409

July 9, 2021

Jeff Mann
Project Manager
AECOM
201 N. Front Street
Suite 509
Wilmington, NC 28401

Re: City of Wilmington Rail Realignment EA – Draft Black Rail Survey Report

Dear Jeff,

Dial Cordy and Associates Inc. (DCA) was contracted by AECOM to develop a survey plan for black rail (*Laterallus jamaicensis*), gain concurrence from USFWS, implement the survey, and prepare this letter report. An introduction to the black rails status, a review of the approved survey methods, and survey results are summarized below.

Introduction

Marsh dependent birds are those that primarily inhabit marsh habitats and many of these species are considered "inconspicuous" or "secretive" in their behavior (Conway 2009). These species include rails, bitterns, herons, egrets, grebes, gallinules, and snipes that typically inhabit dense persistent emergent vegetation in fresh and/or brackish aquatic environments. Except during the breeding season, many of these marsh bird species vocalize infrequently and remain hidden from typical survey methods such as point counts and road-side surveys. As such, call-response surveys are utilized to elicit vocalizations to provide estimations of marsh bird populations. Marsh bird populations are good indicators of environmental health, as marsh birds rely on abundant and diverse fish, amphibian, and invertebrate populations, which are in turn, reliant on good water quality.

Due to their secretive nature and challenging habitat to survey, marsh bird population monitoring data is often limited or lacking in many areas. To our knowledge, no systematic marsh bird surveys have occurred within the project area; however, observations from local birders have identified many marsh bird species in the lower Cape Fear River watershed, including the black rail. One of the most imperiled marsh bird species in North America today is the black rail (Wilson et al 2016). Population declines are linked to habitat loss, tidal flooding, sea level rise, and increasing storm intensity and frequency. Its endangered status listing by the United States Fish and Wildlife Service (USFWS) on 9 November 2020, reinforces the population is in jeopardy. The black rail is known to occur close to the project area as observations have occurred in Southport (4 January 2007) and Wilmington (5 January 2007) (Davis 2008).

Survey Methods

A draft survey plan for black rail was forwarded to the USFWS (John Ellis and John Hammond) on 1 April 2021 to gain approval for the proposed methods. On 20 April 2021 John Hammond concurred with our methods but requested that five replicate surveys be scheduled, rather than the two proposed.

The USFWS approved survey plan is summarized below:

Due to their secretive nature and the habitat preferred by the black rail, species specific survey protocols have been developed and revised over the last decade to increase the likelihood of observing this species. The protocol used for this survey focuses on passive listening and broadcasting intermittent black rail vocalizations to assess black rail populations. Surveys were performed during and shortly after the peak breeding season when bird vocalizations are highest (15 April – 31 May) (Conway 2009). The methods followed during this survey were adapted from the United States Fish and Wildlife Service (USFWS) Southeast Region, 2017 Secretive Marsh Bird Survey Protocol (Smith and Wiest 2017) which is adapted from the Standard North American Marsh Bird Monitoring Protocol (Conway 2009). Standard playback files were acquired from the USFWS and used by DCA biologists. The file attained was 12 minutes and 15 seconds in length consisting of fifteen seconds of "burn in time", followed by two minutes of passive listening, followed by intermittent calls starting with three "Ki Ki Kerr" calls, one "Ik Ik" call, one "growl", and one additional minute of silence. The call sequence MP3 file was loaded onto an MP3 player and broadcast via a Bluetooth amplified speaker (Ankor Soundcore, Model # A3102011). A sound level meter was used to ensure the broadcast was between 70-80 dB (Meterk model: MK09) before every survey. The speaker was mounted to a PVC pole that was inserted into the ground at each survey point and the speaker was oriented to face the largest expanse of marsh.

The surveys were conducted approximately 30 minutes before sunrise to 2.5 hours after sunrise and 2.5 hours before sunset to 30 minutes after sunset. The area covered by the Wilmington Rail Realignment corridor limited the number of broadcast stations to six land stations and five shoreline stations. Consultation with the USFWS on site selection occurred in early April and no additional sites were requested (Figure 1, Table 1). The minimum spacing advised for call/response surveys is 400 meters between each site to prevent any potential overlap of calling birds. One survey replicate consisted of surveying all stations within one week. Survey stations were selected near high marsh areas away from roads, where possible.

Many factors can limit the ability of an observer to hear marsh bird vocalizations; however, wind may be the most limiting factor when conducting call-response surveys. As such, surveys were limited to days with winds less than 20 kilometers/hour (12 miles/hour). Surveyors used a handheld anemometer before and during surveys to ensure winds were acceptable for surveys. Additionally, heavy fog and sustained rain can limit marsh bird vocalizations and should be avoided. The tide stage can also affect detectability of some marsh birds and due to the lunar tide experienced within the Cape Fear, surveys were scheduled around the tides when feasible.

Figure 1. City of Wilmington Rail Realignment Corridor Black Rail Survey Stations, Wilmington, NC (Spring 2021).

Table 1. Wilmington Rail Realignment Black Rail Survey Stations Wilmington, North Carolina (Spring 2021).

Route	Point I.D.	Latitude (DD)	Longitude (DD)
Land Route	L-1	34.22680000	77.95568333
	L-2	34.23316667	77.96628333
	L-3	34.24498333	77.96048333
	L-4	34.24603333	77.96066667
	L-5	34.25031667	77.96081667
	L-6	34.25505000	77.96096667
Water Route	W-1	34.23785000	77.96311667
	W-2	34.24238333	77.96168333
	W-3	34.24206667	77.95863333
	W-4	34.24376667	77.96151667
	W-5	34.24715000	77.96233333

Results

Survey dates and weather conditions for both land and water-based surveys are provided in Table 2. During the surveys, the weather conditions were generally good with very little precipitation. The majority of the sites are relatively protected which reduced the influence the wind had on creating background noise. A description of the habitat at each survey station is provided below.

Habitat Descriptions of Survey Stations

Station L1

The tidal floodplain at Station L1 is entirely dominated by dense monospecific common reed (*Phragmites australis*) stands on dredged material deposits. The stands along Battleship Road that were visually examined appear to be positioned just above MHW where flooding is intermittent by higher than average high tides.

Table 2. Wilmington Rail Realignment Black Rail Call/Response Station Survey Dates and Weather Conditions Wilmington, North Carolina (Spring 2021).

Survey Type	Date	Temp Range (F)	Cloud Cover Range	Precipitation	Wind Range	Ambient Noise Level Range
Land - Morning	4/22/2021	60-64	0-1	None	2-4	2-4
Water - Morning	4/23/2021	52-54	0	None	1	1-3
Water- Evening	5/3/2021	81-82	2	None	3-4	1-4
Land - Evening	5/5/2021	82	1-2	None	3-4	2-3
Land - Morning	5/13/2021	47-51	1-2	None	1-3	1-2
Water - Morning	5/14/2021	54	0	None	1	2
*Water - Morning	5/21/2021	62	0	None	1	1-2
Land - Evening	6/2/2021	77-80	2-5	light drizzle at L3	1-4	1-3
Water-Morning	6/7/2021	77-79	1	None	1	1-2
Land-Evening	6/8/2021	78-81	1	None	0-1	1
Water -Morning	6/14/2021	69-73	1	None	2	1-2

Cloud Cover: 0 -clear or a few clouds, 1-partly cloudy or variable sky, 2-cloudy or overcast, 4-fog or smoke, 5-drizzle, 6-snow, 8-showers

Wind: 0-Smoke rises vertically, 1-wind direction shown by smoke, 2-wind felt on face, 3-leaves and twigs in constant motion, 4-raises dust and loose paper, 5-small trees sway; crested wavelets on inland water

Noise: 0-no noise, 1-faint, 2-moderate, 3-loud, 4-intense

* Makeup date for Station W1 and W5 on 5/14/21

Station L2

The tidal floodplain at Station L2 is strongly dominated by monospecific narrowleaf cattail (*Typha angustifolia*) marshes. The cattail marshes are interspersed with dense patches of common reed on elevated dredged material deposits and scattered salt-stressed trees and shrubs such as bald cypress (*Taxodium distichum*), red maple (*Acer rubrum*), Chinese tallow (*Triadica sebifera*), and wax myrtle (*Morella cerifera*). The position of the MHW line appears to be near the upland boundary along US Highway 74/76. The common reed stands generally occur on tidally-restricted dredged material deposits that are intermittently flooded by higher than average high tides. Otherwise, supratidal high marsh zones that would constitute suitable black rail nesting habitat appear to be absent at this location.

Stations L3 and L4

Dense monospecific common reed stands comprise a 200- to 400-ft-wide zone along the upland boundary at Stations L3 and L4. The remainder of the tidal floodplain between the common reed stands and the Cape Fear River channel is dominated by monospecific cattail marshes. The position of the MHW line appears to be near the upland boundary. The uppermost fringes of the common zone appear to be just above MHW where flooding is intermittent by higher than average high tides. Otherwise, supratidal high marsh zones that would constitute suitable black rail nesting habitat appear to be absent at these locations.

Station L5

The outer portion of the tidal floodplain along the upland boundary at Station L5 is strongly dominated by dense monospecific common reed stands on elevated fill material. The remainder of the tidal floodplain between the common reed stands and the Cape Fear River channel is dominated by monospecific cattail marshes that are interspersed with a few scattered salt-stressed trees (bald cypress). The common reed stands generally occur on tidally-restricted ditch spoil berms and other elevated fill deposits that are intermittently flooded by higher than average high tides. Otherwise, supratidal high marsh zones that would constitute suitable black rail nesting habitat appear to be absent at this location.

Station L6

A narrow (~20-ft-wide) tidal marsh zone along the upland boundary at Station L6 is dominated by narrowleaf cattail and soft-stem bulrush (*Schoenoplectus tabernaemontani*). The remainder of the tidal floodplain is strongly dominated by monospecific narrowleaf cattail marshes. The cattail marshes are interspersed with scattered dead and severely salt-stressed trees and shrubs such as bald cypress, green ash (*Fraxinus pennsylvanica*), swamp tupelo (*Nyssa biflora*), and wax myrtle. The position of the MHW line appears to be within a few feet of the upland boundary. Supratidal high marsh zones that would constitute suitable black rail nesting habitat appear to be absent at this location.

Station W1

The tidal floodplain at Station W1 is dominated by a combination of monospecific narrowleaf cattail marshes and monospecific common reed stands. The cattail marshes are interspersed with small, isolated upland scrub-shrub areas that are dominated by Chinese tallow, Chinaberry (*Melia azedarach*), and wax myrtle. The common reed stands generally occur on tidally-restricted dredged material deposits that are intermittently flooded by higher than average high tides. Otherwise, supratidal high marsh zones that would constitute suitable black rail nesting habitat appear to be absent at this location.

Station W2

A narrow (~20-ft-wide) tidal marsh zone on the slightly elevated river- bank is dominated by narrowleaf cattail and softstem bulrush with scattered big cordgrass (*Spartina cynosuroides*) and saltmarsh water-hemp (*Amaranthus cannabinus*). The top-of-bank zone is backed by expansive monospecific narrowleaf cattail marshes. Supratidal high marsh zones that would constitute suitable black rail nesting habitat appear to be absent at this location.

Station W3

A fringing (5- to 10-ft-wide) smooth cordgrass (*Spartina alterniflora*) zone along the edge of the river channel is backed by a narrow (~50-ft-wide) big cordgrass-saltmarsh bulrush (*Bolboschoenus robustus*) zone on the elevated river- bank. The tidal floodplain beyond the top-of-bank zone is highly altered by dredged material deposits and is dominated by a combination of monospecific narrowleaf cattail marshes, monospecific common reed stands, and isolated upland scrub-shrub areas. Typical woody species of the upland scrub-shrub areas include Chinese tallow, Chinaberry, and wax myrtle. The common reed stands generally occur on tidally-restricted dredged material deposits that are intermittently flooded by higher than average high tides. Otherwise, supratidal high marsh zones that would constitute suitable black rail nesting habitat appear to be absent at this location.

Station W4

A narrow (~50-ft-wide) big cordgrass zone occurs on the slightly elevated river- bank. The tidal floodplain beyond the top-of-bank zone is dominated by a combination of monospecific narrowleaf cattail marshes and monospecific common reed stands. The common reed stands generally occur on tidally-restricted dredged material deposits that are intermittently flooded by higher than average high tides. Otherwise, supratidal high marsh zones that would constitute suitable black rail nesting habitat appear to be absent at this location.

Station W5

Dense monospecific common reed stands comprise a 200- to 400-ft-wide zone along the upland boundary at Stations W5. The remainder of the tidal floodplain between the common reed stands and the Cape Fear River channel is dominated by monospecific cattail marshes. A narrow (~20-ft-wide) tidal marsh zone on the slightly elevated banks of the Cape Fear River and the main rice canals is dominated by narrowleaf cattail, big cordgrass, softstem bulrush, and wild rice (*Zizania aquatica*). The uppermost portions of the common reed zone along the upland boundary appear to be just above MHW where flooding is intermittent by higher than average high tides. Otherwise, supratidal high marsh zones that would constitute suitable black rail nesting habitat appear to be absent at this location.

Marsh Bird Observations

No black rail were heard in response to the calls during all five replicate surveys at the six land- and five water-based stations. Clapper/king rails (*Rallus crepitans*, *Rallus elegans*) were detected at land Station 4 and all water stations during several of the surveys in response to the calls. Over the course of the survey, 15 clapper/king rails were detected (Table 3). The vocalizations of the clapper rail and king rail are essentially indistinguishable, and the Standard North American Marsh Bird Monitoring Program suggests recording the vocalizations heard as clapper/king rails in areas where both species may occur. Additionally, one least bittern (*Ixobrychus exilis*) was observed at water station 1.

Table 3. Wilmington Rail Realignment Marsh Bird Observations Wilmington, North Carolina (Spring 2021).

Station	Date	Common Name	Scientific Name
Land - 4	4/22/2021	Clapper/King Rail	*Rallus crepitans, Rallus elegans*
Water - 1	4/23/2021	Clapper/King Rail	*Rallus crepitans, Rallus elegans*
Water - 2	4/23/2021	Clapper/King Rail	*Rallus crepitans, Rallus elegans*
Water - 5	4/23/2021	Clapper/King Rail	*Rallus crepitans, Rallus elegans*
Water - 3	5/3/2021	Clapper/King Rail	*Rallus crepitans, Rallus elegans*
Water - 3	5/14/2021	Clapper/King Rail	*Rallus crepitans, Rallus elegans*
Water - 1	5/21/2021	Clapper/King Rail	*Rallus crepitans, Rallus elegans*
Water - 1	5/21/2021	Clapper/King Rail	*Rallus crepitans, Rallus elegans*
Water - 1	5/21/2021	Clapper/King Rail	*Rallus crepitans, Rallus elegans*
Water - 1	5/21/2021	Clapper/King Rail	*Rallus crepitans, Rallus elegans*
Water - 1	5/21/2021	Clapper/King Rail	*Rallus crepitans, Rallus elegans*
Water - 1	6/7/2021	Clapper/King Rail	*Rallus crepitans, Rallus elegans*
Water - 1	6/7/2021	Clapper/King Rail	*Rallus crepitans, Rallus elegans*
Water - 1	6/7/2021	Least Bittern	*Ixobrychus exilis*
Water - 1	6/7/2021	Clapper/King Rail	*Rallus crepitans, Rallus elegans*
Water - 4	6/14/2021	Clapper/King Rail	*Rallus crepitans, Rallus elegans*

The preferred habitat of the black rail is the high marsh. The high marsh is typically only inundated during extreme high tide events and is dominated by plants such as marsh elder (*Iva frutescens)*, saltgrass (*Distichlils spicata)*, and salt meadow hay (*Spartina patens)*. The majority of the area within the proposed rail realignment corridor has very minimal high marsh due to anthropogenic modification of the system. Based on the lack of high marsh habitat common to this area of the river, the habitat located within the study area would not be expected to be used commonly by black rail for nesting, as occurs in the lower more saline and less disturbed portions of the Cape Fear River.

Literature Cited

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Davis, Ricky. 2008. Briefs for the Files. The Chat Vol 72 No 2 Spring 2008, Carolina Bird Club, 608 Smallwood Drive, Rocky Mount, NC 27804. Unpublished Report.

Smith, Adam. Wiest, Whitney. 2017. 2017 Secretive Marsh Bird Survey -USFWS Southeast Region. United States Fish and Wildlife Service, Unpublished Report.

Wilson, M.D., B. D. Watts, and D. Poulton. 2016. Black Rail Status Survey in North Carolina. Center for Biology Technical Report Series, CCBTR-16-01. College of William and Mary and Virginia Commonwealth University. 21 pp.

Should you have any questions regarding the content of our report, please contact either James Hargrove or myself.

Regards,

Dial Cordy and Associates Inc.

R. Steve Dial
President

DIAL CORDY
AND ASSOCIATES INC
Environmental Consultants

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May 17, 2021

Jeff Mann
Project Manager
AECOM
201 N. Front Street
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Wilmington, NC 28401

Re: City of Wilmington Rail Realignment Rail EA – Bald Eagle Survey

Dear Mr. Mann:

Dial Cordy and Associates Inc. (DCA) has completed the bald eagle (*Haliaeetus leucocephalus*) nest survey for the above study and is submitting this letter report as part of our contractual requirements with AECOM. The bald eagle is protected under the Bald and Golden Eagle Protection Act (Eagle Act) and the Migratory Bird Treaty Act (MBTA), which prohibit the take of bald eagles and their nests without a permit. In accordance with survey protocol contained in the National Bald Eagle Management Guidelines (USFWS 2007) and the NCDOT Guidelines to Assess Potential Project Impacts to the Bald Eagle and Survey Protocols (NCDOT 2015), a pedestrian survey of the study corridor, inclusive of a 660-ft buffer, was performed to identify bald eagle nests and determine the status of the one known nest (Element Occurrence # 27956) located at the north end of the corridor (Figure 1). All forested areas and potential nest trees within the corridor were visually inspected for the presence of nests. The general corridor nest survey was performed on April 1 and 8, 2021. Known nest status surveys were conducted between 0630-0800 am on April 1, 9 and 12, 2021. DCA staff participating in the surveys included James Hargrove, Rahlff Ingle and Steve Dial.

Survey Results and Observations

No bald eagle nests were observed within the survey area other than the one known nest cited above. Surveys of the known nest site documented the presence of an active nest with at least one eaglet (Photograph 1 and 2). The nest is positioned near the top of a large loblolly pine (*Pinus taeda*) that is 80-90 feet (ft) in height and ~20 inch (in) diameter at breast height. The nest tree coordinates are N 34º 15.482', W 077º 57.755', located 233 ft west of the corridor (Figure 1). During the first visit on 1 April 2021, the male eagle responded to our presence by posting on

trees over 300 ft from the nest tree and flying in large circles around the nest tree. One flight by the male from an isolated cypress tree in the adjacent marsh to the nest tree was abruptly aborted, apparently in response to our presence at a distance of ~200 ft from the nest tree. No eagle activity was observed during the second visit on 9 April 2021. On the third and final visit on 12 April 2021, a fledging was observed moving and extending its wings above the edge of the nest. Therefore, it can be concluded that the nest is active with at least one eaglet.

Habitat Description for Eagle Nest Tree Location

The nest site is a linear upland feature on the tidal floodplain of the Cape Fear River. The associated plant community is a relatively natural coastal fringe evergreen forest with an open canopy of loblolly pine (*Pinus taeda*), sand laurel oak (*Quercus hemisphaerica*), magnolia (*Magnolia grandiflora*), and sweetgum (*Liquidambar styraciflua*). Scattered understory trees include American beech (*Fagus grandifolia*) and American holly (*Ilex opaca*). The moderately dense shrub layer is dominated by American holly, witch-hazel (*Hamamelis virginiana*), blueberry (*Vaccinium* sp.), wild olive (*Osmanthus americanus*), and dwarf paw paw (*Asimina parviflora*). The groundcover stratum is dominated by sparse woody vines such as muscadine (*Vitis rotundifolia*) and greenbrier (*Smilax* sp.).

Past Activity at Element Occurrence

Based on the NC Natural Heritage Program (NCNHP) Element Occurrence (EO) record (# 27956), the existing nest tree and an additional tree at the site have historically been used by bald eagles. The EO record includes the following incomplete annual nest survey data: active nest 2008-2009 (D. Allen NCWRC), no survey 2011-2012, and inactive nest 2015 (Carpenter NCWRC 2018-2019).

Conclusion

Based on the presence of an active bald eagle nest within the survey area, consultation with the USFWS pursuant to the Eagle Act will be required for the proposed project. If it is determined that the project will result in the take of eagles (disturbance, injury, or killing) or an eagle nest (removal, relocation, or destruction), an incidental take permit or nest take permit will be required, respectively.

Regards,

DIALCORDY AND ASSOCIATES INC.

R Steve Dial

R. Steve Dial
President

cc. J21-1460

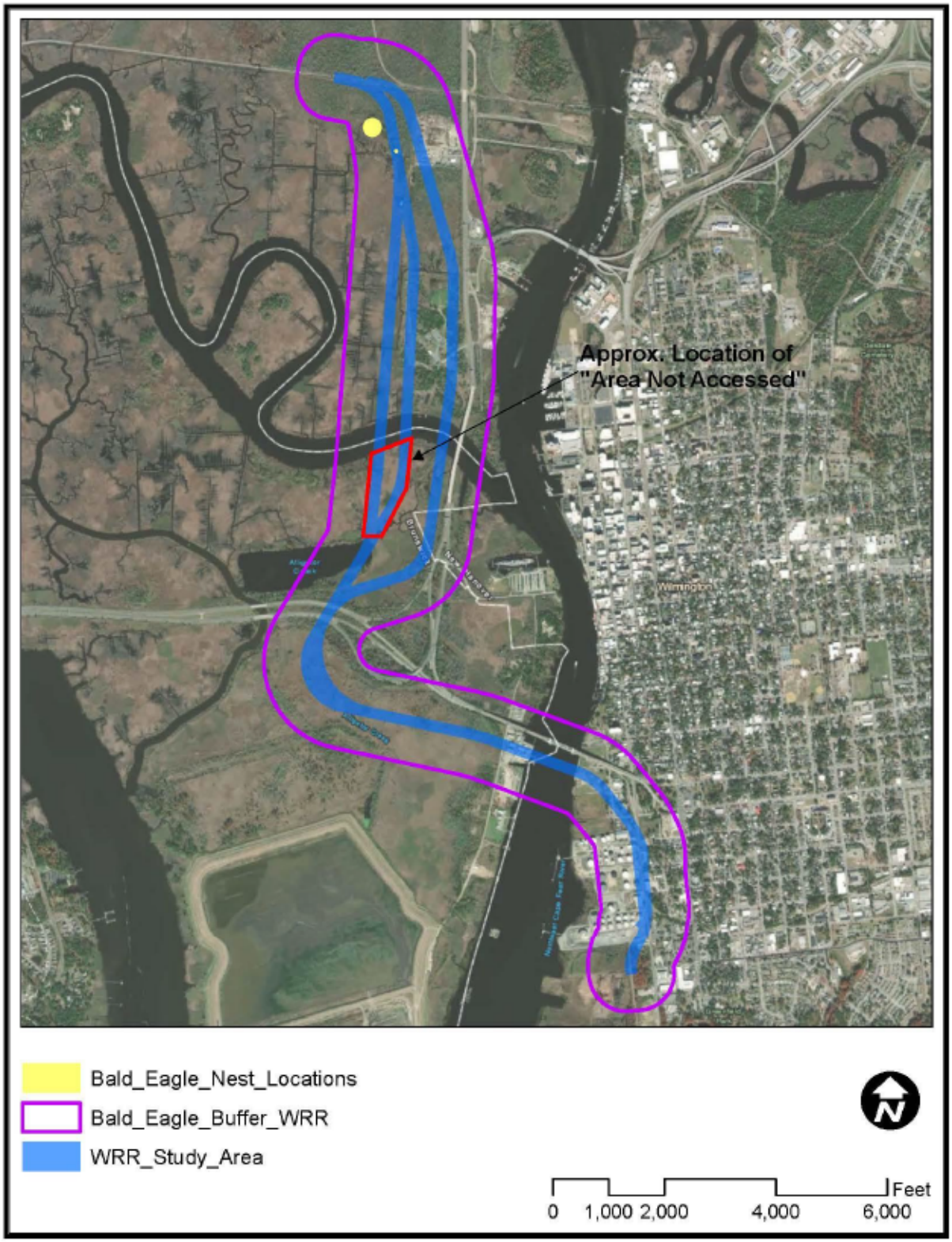

Figure 1. City of Wilmington Rail Realignment Study Area and Bald Eagle Buffer Area.

Photograph 1. Bald Eagle Active Nest Tree.

Photograph 2. Close up of Bald Eagle Nest in Loblolly Pine.

Appendix F.
Agency Coordination

Letter Invitation to Become a Cooperating Agency and Initiation of Section 7 Consultation to USFWS for the Wilmington Rail Realignment

Letter Invitation to Become a Cooperating Agency and Initiation of Section 7 Consultation to NOAA National Marine Fisheries Service for the Wilmington Rail Realignment

Letter Response to Cooperating Agency Request from NOAA National Marine Fisheries for the Wilmington Rail Realignment

ESA Section 7 Coordination Letter from USFWS

NC Division of Coastal Management Coastal Wetlands Evaluation Site Visit Notes

U.S. Department
of Transportation

**Federal Railroad
Administration**

1200 New Jersey Avenue, SE
Washington, DC 20590

November 5, 2021

United States Fish and Wildlife Service
Raleigh Field Office
John Ellis
Federal Project Review Under ESA
551-F Pylon Drive
Raleigh, NC 27606

RE: Invitation to Become a Cooperating Agency and Initiation of Section 7 Consultation
Wilmington Rail Realignment
Brunswick and New Hanover Counties

Dear Mr. Ellis,

The Federal Railroad Administration as the lead Federal Agency, in coordination with the City of Wilmington (City), is initiating an Environmental Assessment (EA) for a proposed new freight rail route to bypass the existing route between Navassa (Davis Yard) and the Port of Wilmington. The Project, referred to as the Wilmington Rail Realignment, involves realigning an existing CSX Transportation (CSXT) freight rail line that traverses through City limits as well as unincorporated areas of Brunswick and New Hanover counties. The primary purpose of the project is to improve safety, regional transportation mobility, and freight rail operations, while also improving the resiliency, reliability, and operational fluidity of the sole freight rail route connecting southeastern North Carolina with the Port of Wilmington.

Cooperating Agency Invitation
The United States Fish and Wildlife Service was identified as an agency that may have a particular interest in the project or eventual permitting authority. With this letter, we are extending to your agency an invitation to be a Cooperating Agency with the FRA in the development of an EA for the subject project, in accordance with 40 CFR 1501.6 of the Council on Environmental Quality's (CEQ) regulations for Implementing the Procedural Provision of the National Environmental Policy Act[1]. As planning for the project progresses, the FRA will work with Cooperating Agencies to develop communication protocols, schedule, and process as part of the agency coordination plan.

Cooperating Agencies are those government or regulatory agencies with jurisdiction by law (e.g., with permitting or land transfer authority) or special expertise with respect to any environmental

1 This project was initiated prior to the 2020 update to the Council on Environmental Quality's (CEQ) regulations for Implementing the Procedural Provision of the National Environmental Policy Act.

impact or resource involved in an environmental review or alternative for study. In general, Cooperating Agencies are responsible for identifying, as early as practicable, any issues of concern regarding the project's potential environmental or socioeconomic impacts that could substantially delay or prevent an agency from granting a permit or other approval that is needed for the project. We suggest that your agency's role in the development of the above project include the following as they relate to your area of expertise:

- Provide meaningful and early input on defining the purpose and need, determining the range of alternatives to be considered, and the methodologies and level of detail required in the alternatives analysis.
- Participate in coordination meetings and joint field reviews as appropriate.
- Timely review and comment on documents provided for your agency's input during the environmental review process.

NEPA Evaluation and Section 7 Initiation

FRA's planning process identifies two phases: Pre-NEPA and NEPA. The goal of the Pre-NEPA phase is to identify a Preferred Alternative that would advance through the NEPA process. As part of this Pre-NEPA phase, the City prepared a Draft Purpose and Need[2] and completed the Wilmington Rail Realignment Screening Report[3] (Screening Report) in January 2021. Additionally, an Alternatives Analysis was approved by FRA on November 1, 2021. In the Alternatives Analysis, each alternative was reviewed using a set of engineering and environmental evaluation factors. Based on each alternative's performance against those criteria, the City and FRA recommend Alternative 2 as the Preferred Alternative.

With a Preferred Alternative identified, the Project has now advanced from the "Pre-NEPA" phase to the "NEPA" phase consistent with FRA's project development process. FRA will prepare an Environmental Assessment (EA) to evaluate the Preferred Alternative in comparison to the No-Build Alternative and build upon the findings presented in the Alternatives Analysis. More detailed analysis and engineering will be prepared for the Preferred Alternative as necessary to further assess effects on various environmental resources and develop mitigation measures, as appropriate.

Based on studies conducted thus far, the following federally listed species were identified for assessing effects of project actions in accordance with Section 7 of the Endangered Species Act.

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[2] AECOM. 2021a. Wilmington Rail Realignment Draft Purpose and Need Report. January 2021. https://www.wilmingtonnc.gov/home/showpublisheddocument/12838/637491697074270000

[3] AECOM. 2021b. Wilmington Rail Realignment Corridor Screening Report. January 2021. https://www.wilmingtonnc.gov/home/showpublisheddocument/12840/637491697093000000

Table 1: Federally listed species requiring Section 7 coordination

American alligator	*Alligator mississippiensis*	T(S/A)	B, NH	Yes
Black rail	*Laterallus jamaicensis*	T	NH	Yes
Piping plover	*Charadrius melodus*	T	B, NH	No
Red knot	*Calidris canutus rufa*	T	B, NH	No
Red-cockaded woodpecker	*Picoides borealis*	E	B, NH	Yes
West Indian manatee	*Trichechus manatus*	E	B, NH	Yes
Wood stork	*Mycteria americana*	T	B	Yes
Northern long-eared bat	*Myotis septentrionalis*	T	NH	Yes
Cooley's meadowrue	*Thalictrum cooleyi*	E	B, NH	Yes
Golden sedge	*Carex lutea*	E	NH	Yes
Rough-leaved loosestrife	*Lysimachia asperulaefolia*	E	B, NH	Yes

[1] E=endangered; T=threatened; T(S/A) =threatened due to similarity of appearance.

[2] B=Brunswick County; NH=New Hanover County

During the spring of 2021, surveys were conducted for some of the listed species with limited/no available existing data on presence/absence in the project area including black rail (Laterallus jamaicensis), Cooley's meadowrue (Thalictrum cooleyi), golden sedge (Carex lutea), and rough-leaved loosestrife (Lysimachia asperulaefolia). Additionally, surveys of two known bald eagle nest sites occurred on April 1, 9 and 12. One nest site is active (N 34° 15.482', W 077° 57.755') with a juvenile eagle observed within the nest, the other nest tree no longer exists. Black rail surveys were conducted using broadcast-response methodology between April and June at six land-based sites and five water-based sites. No black rail were observed during these surveys. On April 8th, 2021 a survey for the listed plant species occurred. It was determined that no suitable habitat existed for those listed plants within the Project corridor.

The purpose of this letter, in additional to the invitation to be a Cooperating Agency for the Project, is to share this preliminary information and engage in early discussions concerning the Section 7 process. FRA requests your comments on the information in this letter as we begin preparation of the Environmental Assessment.

We look forward to a collaborative working relationship with the USFWS on this project. If you have any questions or would like to discuss in more detail the project or our agencies' respective roles and responsibilities during preparation of the EA, please contact Kevin Wright at 202-493-0845 or kevin.wright@dot.gov.

Thank you for your cooperation and interest in this project.

Sincerely,

Michael Johnsen
Supervisory Environmental Protection Specialist

cc: Kevin Wright, Environmental Protection Specialist, FRA
Aubrey Parsley, Director of Rail Realignment, City of Wilmington, NC

Enclosure: Alternatives Analysis Report

U.S. Department
of Transportation

**Federal Railroad
Administration**

1200 New Jersey Avenue, SE
Washington, DC 20590

November 5, 2021

National Marine Fisheries Service
Southeast Regional Office
Mary Wunderlich
Section 7 Coordinator
263 13th Avenue South
St. Petersburg, FL 33701

RE: Invitation to Become a Cooperating Agency and Initiation of Section 7 Consultation
Wilmington Rail Realignment
Brunswick and New Hanover Counties

Dear Ms. Wunderlich,

The Federal Railroad Administration as the lead Federal Agency, in coordination with the City of Wilmington (City), is initiating an Environmental Assessment (EA) for a proposed new freight rail route to bypass the existing route between Navassa (Davis Yard) and the Port of Wilmington. The Project, referred to as the Wilmington Rail Realignment, involves realigning an existing CSX Transportation (CSXT) freight rail line that traverses through City limits as well as unincorporated areas of Brunswick and New Hanover counties. The primary purpose of the project is to improve safety, regional transportation mobility, and freight rail operations, while also improving the resiliency, reliability, and operational fluidity of the sole freight rail route connecting southeastern North Carolina with the Port of Wilmington.

Cooperating Agency Invitation
The National Marine Fisheries Service was identified as an agency that may have a particular interest in the project or eventual permitting authority. With this letter, we are extending to your agency an invitation to be a Cooperating Agency with the FRA in the development of an EA for the subject project, in accordance with 40 CFR 1501.6 of the Council on Environmental Quality's (CEQ) regulations for Implementing the Procedural Provision of the National Environmental Policy Act[1]. As planning for the project progresses, the FRA will work with Cooperating Agencies to develop communication protocols, schedule, and process as part of the agency coordination plan.

Cooperating Agencies are those government or regulatory agencies with jurisdiction by law (e.g., with permitting or land transfer authority) or special expertise with respect to any environmental

1 This project was initiated prior to the 2020 update to the Council on Environmental Quality's (CEQ) regulations for Implementing the Procedural Provision of the National Environmental Policy Act.

impact or resource involved in an environmental review or alternative for study. In general, Cooperating Agencies are responsible for identifying, as early as practicable, any issues of concern regarding the project's potential environmental or socioeconomic impacts that could substantially delay or prevent an agency from granting a permit or other approval that is needed for the project. We suggest that your agency's role in the development of the above project include the following as they relate to your area of expertise:

- Provide meaningful and early input on defining the purpose and need, determining the range of alternatives to be considered, and the methodologies and level of detail required in the alternatives analysis.
- Participate in coordination meetings and joint field reviews as appropriate.
- Timely review and comment on documents provided for your agency's input during the environmental review process.

NEPA Evaluation and Section 7 Initiation

FRA's planning process identifies two phases: Pre-NEPA and NEPA. The goal of the Pre-NEPA phase is to identify a Preferred Alternative that would advance through the NEPA process. As part of this Pre-NEPA phase, the City prepared a Draft Purpose and Need[2] and completed the Wilmington Rail Realignment Screening Report[3] (Screening Report) in January 2021. Additionally, an Alternatives Analysis was approved by FRA on November 1, 2021. In the Alternatives Analysis, each alternative was reviewed using a set of engineering and environmental evaluation factors. Based on each alternative's performance against those criteria, the City and FRA recommend Alternative 2 as the Preferred Alternative.

With a Preferred Alternative identified, the Project has now advanced from the "Pre-NEPA" phase to the "NEPA" phase consistent with FRA's project development process. FRA will prepare an Environmental Assessment (EA) to evaluate the Preferred Alternative in comparison to the No-Build Alternative and build upon the findings presented in the Alternatives Analysis. More detailed analysis and engineering will be prepared for the Preferred Alternative as necessary to further assess effects on various environmental resources and develop mitigation measures, as appropriate.

Based on our team's environmental screening, the following federally listed species and critical habitats were identified for assessing effects of project actions in accordance with Section 7 of the Endangered Species Act (Tables 1 and 2). While the North Atlantic right whale is not likely to be an issue relative to Section 7 consultation, it is listed for the two counties.

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[2] AECOM. 2021a. Wilmington Rail Realignment Draft Purpose and Need Report. January 2021. https://www.wilmingtonnc.gov/home/showpublisheddocument/12838/637491697074270000

[3] AECOM. 2021b. Wilmington Rail Realignment Corridor Screening Report. January 2021. https://www.wilmingtonnc.gov/home/showpublisheddocument/12840/637491697093000000

Table 1: Federally listed species requiring Section 7 consultation

Common Name		
Shortnose sturgeon	*Acipenser brevirostrum*	Endangered
Atlantic Sturgeon	*Acipenser oxyrhynchus*	Endangered
North Atlantic right whale	*Eubalaena glacialis*	Endangered
Loggerhead turtle	*Caretta caretta*	Threatened

Table 2: Designated critical habitat in the vicinity of the action area

Critical Habitat		
Atlantic Sturgeon Carolina DPS	Unit 4	The Cape Fear River main stem from Lock and Dam #2 downstream to RKM 0 and the Northeast Cape Fear River from the upstream side of Rones Chapel Road Bridge downstream to the confluence with the Cape Fear Rive

The purpose of this letter, in additional to the invitation to be a Cooperating Agency for the Project, is to share this preliminary information and engage in early discussions concerning the Section 7 process. FRA requests your comments on the information in this letter as we begin preparation of the Environmental Assessment.

We look forward to a collaborative working relationship with the NMFS on this project. If you have any questions or would like to discuss in more detail the project or our agencies' respective roles and responsibilities during preparation of the EA, please contact Kevin Wright at 202-493-0845 or kevin.wright@dot.gov.

Thank you for your cooperation and interest in this project.

Sincerely,

Michael Johnsen
Supervisory Environmental Protection Specialist

cc: Kevin Wright, Environmental Protection Specialist, FRA
Aubrey Parsley, Director of Rail Realignment, City of Wilmington, NC
Enclosure: Alternatives Analysis Report

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
263 13th Avenue South
St. Petersburg, Florida 33701-5505
https://www.fisheries.noaa.gov/region/southeast

12/03/2021

F:SER/BR

Amit Bose, Deputy Administrator
Federal Railroad Administration, Office of Communications
U.S. Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590

Attention: Michael Johnsen, Kevin Wright, Aubrey Parsley

Re: Wilmington Rail Realignment, Cooperating Agency Request

Dear Deputy Administrator Bose:

NOAA's National Marine Fisheries Service (NMFS) has received your letter dated November 5, 2021, requesting our participation as a cooperating agency in the development of an Environmental Assessment for the Wilmington Rail Realignment. Given our special expertise and jurisdiction by law under the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and the Endangered Species Act (ESA), NMFS agrees to serve as a cooperating agency for this project. Due to staffing constraints, our participation may be limited to attendance of teleconferences and reviewing National Environmental Policy Act documents.

We appreciate your invitation to serve as a cooperating agency for this project. For questions pertaining to the MSA or ESA, please direct correspondences to Mr. Fritz Rohde (fritz.rohde@noaa.gov) or Mr. Joseph Cavanaugh (joseph.cavanaugh@noaa.gov), respectively.

Sincerely,

FAY.VIRGINIA.M.1365817320 Digitally signed by FAY.VIRGINIA.M.1365817320 Date: 2021.12.03 13:27:13 -05'00'

for Andrew J. Strelcheck
Regional Administrator

cc: F, Chabot, Youngkin,
F/SER, Strelcheck, Fay, Blough, Silverman, Barnette, Rosegger
F/SER3, Bernhart, Shotts, Reece, Cavanaugh
F/SER4, Wilber, Karazsia, Rohde

United States Department of the Interior
FISH AND WILDLIFE SERVICE
Raleigh ES Field Office
551-F Pylon Drive
Raleigh, North Carolina 27606

September 8, 2022

Kevin Wright
US DOT- Federal Railroad Administration
1200 New Jersey Avenue, SE
Washington, DC 20590

Re: City of Wilmington Rail Realignment – Brunswick and New Hanover Counties

Dear Mr. Wright:

This letter is to inform you that the Service has established an on-line project planning and consultation process which assists developers and consultants in determining whether a federally-listed species or designated critical habitat may be affected by a proposed project. For future projects, please visit the Raleigh Field Office's project planning website at https://www.fws.gov/office/eastern-north-carolina/project-planning-and-consultation. If you are only searching for a list of species that may be present in the project's Action Area, then you may use the Service's Information, Planning, and Consultation System (IPaC) website to determine if any listed, proposed, or candidate species may be present in the Action Area and generate a species list. The IPaC website may be viewed at https://ipac.ecosphere.fws.gov/. The IPaC web site contains a complete and frequently updated list of all endangered and threatened species protected by the provisions of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.)(Act), a list of federal species of concern[1] that are known to occur in each county in North Carolina, and other resources.

Section 7 of the Act requires that all federal agencies (or their designated non-federal representative), in consultation with the Service, ensure that any action federally authorized, funded, or carried out by such agencies is not likely to jeopardize the continued existence of any federally-listed endangered or threatened species. A biological assessment or evaluation may be prepared to fulfill that requirement and in determining whether additional consultation with the Service is necessary. In addition to the federally-protected species list, information on the species' life histories and habitats and information on completing a biological assessment or

[1] The term "federal species of concern" refers to those species which the Service believes might be in need of concentrated conservation actions. Federal species of concern receive no legal protection and their designation does not necessarily imply that the species will eventually be proposed for listing as a federally endangered or threatened species. However, we recommend that all practicable measures be taken to avoid or minimize adverse impacts to federal species of concern.

evaluation and can be found on our web page at https://fws.gov/office/eastern-north-carolina. Please check the web site often for updated information or changes.

If your project contains suitable habitat for any of the federally-listed species known to be present within the county where your project occurs, the proposed action has the potential to adversely affect those species. As such, we recommend that surveys be conducted to determine the species' presence or absence within the project area. The use of North Carolina Natural Heritage program data should not be substituted for actual field surveys.

If you determine that the proposed action may affect (i.e., likely to adversely affect or not likely to adversely affect) a federally-protected species, you should notify this office with your determination, the results of your surveys, survey methodologies, and an analysis of the effects of the action on listed species, including consideration of direct, indirect, and cumulative effects, before conducting any activities that might affect the species. If you determine that the proposed action will have no effect (i.e., no beneficial or adverse, direct or indirect effect) on federally listed species, then you are not required to contact our office for concurrence (unless an Environmental Impact Statement is prepared). However, you should maintain a complete record of the assessment, including steps leading to your determination of effect, the qualified personnel conducting the assessment, habitat conditions, site photographs, and any other related articles.

With regard to the above-referenced project, we offer the following remarks. Our comments are submitted pursuant to, and in accordance with, provisions of the Endangered Species Act.

Based on the information provided and other information available, it appears that the proposed action is not likely to adversely affect any federally-listed endangered or threatened species, their formally designated critical habitat, or species currently proposed for listing under the Act at these sites. We believe that the requirements of section 7(a)(2) of the Act have been satisfied for your project. Please remember that obligations under section 7 consultation must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered; (2) this action is subsequently modified in a manner that was not considered in this review; or, (3) a new species is listed or critical habitat determined that may be affected by the identified action.

However, the Service is concerned about the potential impacts the proposed action might have on aquatic species. Aquatic resources are highly susceptible to sedimentation. Therefore, we recommend that all practicable measures be taken to avoid adverse impacts to aquatic species, including implementing directional boring methods and stringent sediment and erosion control measures. An erosion and sedimentation control plan should be submitted to and approved by the North Carolina Division of Land Resources, Land Quality Section prior to construction. Erosion and sedimentation controls should be installed and maintained between the construction site and any nearby down-gradient surface waters. In addition, we recommend maintaining natural, vegetated buffers on all streams and creeks adjacent to the project site.

The North Carolina Wildlife Resources Commission (NCWRC) has developed a Guidance Memorandum (found at https://www.ncwildlife.org/Conserving/Learn-Resources/Ways-to-Conserve) to address and mitigate secondary and cumulative impacts to aquatic and terrestrial

wildlife resources and water quality. We recommend that you consider this document and the NCWRC's other conservation recommendations in the development of your projects and in completing an initiation package for consultation (if necessary).

We hope you find our web page useful and informative and that following the process described above will reduce the time required, and eliminate the need, for general correspondence for species' lists. If you have any questions or comments, please contact John Ellis of this office at (919) 856-4520 ext. 26.

Sincerely,

John Ellis for

Pete Benjamin

Field Supervisor

MEETING NOTES

PROJECT NAME	Wilmington Rail Realignment
PROJECT NUMBER	WSP #30900288.00
DATE	09 December 2021
TIME	9:30am – 1:00pm
VENUE	On-Site
SUBJECT	Coastal Wetlands Evaluation Site Visit
CLIENT	City of Wilmington
PRESENT	NC DCM: Stephen Lane WSP: Amanda Johnson, Caleb Sullivan

Meeting Minutes

1.0 INTRODUCTION

All attendees met at the Scotchman located at 1610 US-421, Wilmington, NC, 28401. Amanda stated the goals for the site visit and provided a brief description of the areas she planned to review with Stephen. For this site visit, WSP did not request an official determination from the NC Division of Coastal Management (DCM) for the Preferred Alternative coastal wetland boundaries but wanted to focus on a few areas to make refinements to the boundaries that will be shown in the Environmental Assessment (EA).

2.0 FIELD-REVIEWED AREAS

The attendees reviewed the coastal wetlands in and surrounding the power line corridor on the Bryden property, north of the New Hanover County sheriff's property (Figure 1, Sheet 1). Stephen agreed with the coastal wetland boundaries shown around the house on the property. The attendees walked southeast down the power line corridor to review the coastal wetland boundaries along the forested area. Due to deep water and mucky field conditions, the attendees did not walk the entire boundary. Stephen agreed the boundaries shown likely represent the approximate coastal wetland boundary. Vegetation observed through the coastal wetland included *Phragmites australis* (common reed) and *Typha* species (cattails). Amanda asked Stephen about how DCM would view monotypic common reed stands in areas surrounded by coastal wetland. Stephen explained that if these areas occurring within a contiguous coastal wetland are still functioning the same as coastal wetlands, they would still be considered coastal wetland.

The attendees then reviewed a coastal wetland boundary on the Bryden property southwest of the New Hanover County sheriff's property (Figure 1, Sheet 2). Amanda pointed out that *Spartina cynosuroides* (giant cordgrass) was present around the streams/ditches to the west. Stephen agreed with the coastal wetland boundary.

The attendees then reviewed the area mapped as coastal wetland around the power line corridor just north of the interchange and south of the open water (impoundment of Alligator Creek) (Figure 1, Sheet 4). Stephen pointed out there were freshwater plant species mixed with coastal wetland species. Given the amount of freshwater vegetation, distance from a direct connection with tidal water,

WSP USA
Suite 1500
434 Fayetteville Street
Raleigh, NC 27601
wsp.com

and the slightly higher elevation, he did not consider this area a coastal wetland. Amanda noted she would remove the area from the mapped coastal wetlands. The coastal wetland shown adjacent to the Alligator Creek impoundment was not reviewed in the field but assumed to be coastal wetland based on its connection to the open water. Amanda noted that area is covered in common reed.

The last area the attendees reviewed were the mapped coastal wetland boundaries just south of the US 17/US 421 interchange, west of Battleship Road NE (Figure 1, Sheet 5). Stephen did not think the first area reviewed (Hufham property) was coastal wetland based on the amount of freshwater vegetation (*Carex* species dominated the herbaceous stratum) and that the area is at a slightly higher elevation and not likely regularly flooded by tides. He also pointed out he was not seeing the thick muck layer that is typical of coastal wetlands. Amanda said she would remove that area from the mapped coastal wetlands.

The attendees walked west to the next area mapped as coastal wetland. Stephen said he did not see evidence that the area was coastal wetland, so everyone walked approximately 300 feet west farther into the marsh. The attendees reviewed the aerial imagery of the remaining polygon shown as coastal wetland on the field map and compared it to visible field conditions. Stephen said the remaining area was not likely coastal wetland since there were no noticeable changes in elevation and vegetation throughout the area, and that the area was not likely regularly flooded by tides. Amanda said she would remove that area from the mapped coastal wetlands.

3.0 CLOSING DISCUSSION

After the attendees completed the field review, Amanda and Stephen discussed the few aspects of the project:

- Stephen noted that DCM would expect to see bridging over coastal wetlands. Amanda asked if there were specific height requirements. Stephen said that docks and piers must have a height of at least 3 feet, so DCM would expect no lower than that. Heights for bridges should be evaluated for avoidance/minimization but DCM understands practicability will be considered as well.
- Shading from a bridge is not considered a mitigatable impact for the DCM. Stephen said he remembered a document from the NC Department of Transportation (NCDOT) that included research on shading impacts. If he is able to locate the document, he said he would send it to Amanda.
- Stephen pointed out there will be construction moratoria for Primary Nursery Area and sturgeon. He recommended to discuss the construction window with the agencies.
- Amanda asked about determining the normal high water line for the project, given the size of the study area. She said Katharine Elks recommended having a topographic survey of the project area and using tidal datum to determine the mean high and low water lines instead of delineating the normal high water line in the field. Stephen agreed with that approach.
- To close the site visit, Stephen requested that Amanda send revised figures reflecting the changes that were made during the site visit. She agreed and stated that she would send out meeting notes as well.

4.0 ACTION ITEMS

Action Item	Responsible Party
Provide updated figures (attached) and site visit meeting notes to Stephen Lane	Amanda Johnson
Send a document from NCDOT that discusses shading impacts from bridges	Stephen Lane

Johnson, Amanda M.

From: Lane, Stephen <stephen.lane@ncdenr.gov>
Sent: Friday, January 7, 2022 9:38 AM
To: Johnson, Amanda M.
Cc: Sullivan, Caleb P.; Karagosian, Adam H.; Anderson, Susan; Joanna.rocco@aecom.com; celia.miars
Subject: RE: [External] Wilmington Rail Realignment DCM Site Visit 12.9.21

Hi Amanda,

Happy New Year!

I'm sorry it has taken a while to get back to you on this one but I am just getting caught up from the holidays.

I appreciate you and Caleb meeting with me on this large project as well. I have reviewed the meeting notes from our December 9th, 2021 field visit to the Wilmington Rail Realignment project, as well as the maps of the Coastal Wetland boundaries to be shown in the Environmental Assessment for the project, and I am satisfied that they reflect our discussions during our field visit to the site. I will place these items in my files for the project and look forward to reviewing the EA when it becomes available. Please let me know if I may be of any further assistance.

Sincerely,

Stephen Lane
Coastal Management Representative

From: Johnson, Amanda M. <Amanda.Johnson@wsp.com>
Sent: Friday, December 17, 2021 7:58 AM
To: Lane, Stephen <stephen.lane@ncdenr.gov>
Cc: Sullivan, Caleb P. <Caleb.Sullivan@wsp.com>; Karagosian, Adam H. <Adam.Karagosian@wsp.com>; Anderson, Susan <Susan.Anderson@aecom.com>; Joanna.rocco@aecom.com; celia.miars <celia.miars@aecom.com>
Subject: [External] Wilmington Rail Realignment DCM Site Visit 12.9.21

Hi, Stephen.

Thank you for meeting Caleb and me on December 9th, 2021 to review the coastal wetlands for the Wilmington Rail Realignment project. Attached are the meeting notes and revised figures with the adjusted coastal wetland boundaries as we discussed. Please let me know if there are any revisions you would like me to make to more accurately reflect our discussions.

Amanda Johnson, PWS
Lead Consultant, Environmental Scientist

T+ 1 919-376-2733
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WSP USA Inc.
434 Fayetteville Street
Suite 1500
Raleigh, NC 27601

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APPENDIX E: NAVIGATION IMPACT REPORTS

CITY OF WILMINGTON
NORTH CAROLINA

City Manager's Office
102 North Third Street
PO Box 1810
Wilmington, NC 28402-1810

910 341-7810
910 341-5839 fax
wilmingtonnc.gov
Dial 711 TTY/Voice

Date: September 24, 2021

To: Mr. Hal R. Pitts
Commander, Bridge Branch, Fifth Coast Guard District
Federal Building
431 Crawford Street
Portsmouth, VA 23704

Subject: The Wilmington Rail Realignment Project - Navigation Impact Reports

Dear Mr. Pitts:

The City of Wilmington (City) is writing in response to your letter dated April 6, 2021 regarding our submittal of a Project Initiation Request (PIR) to establish a bridge permitting project for the Wilmington Rail Realignment Project (Project) located in New Hanover County and Brunswick County, North Carolina. As was identified in your letter, the City's team has reviewed the guidance provided in Section 1 and Appendix A of the USCG Bridge Permit Application Guide, COMPDTPUB P16591.3D, July 2016, and enclose herein two Navigation Impact Reports (NIR) for your review and consideration.

This cover letter is intended to provide Project background, discuss the City's approach to completing the enclosed NIRs and summarize key findings. Please note that both NIRs contain supplemental exhibits to provide you with additional information which we hope will assist the US Coast Guard's review process. The materials enclosed include:

NIR Cape Fear River Above Wilmington

- Exhibit A – Hydrographic Survey
- Exhibit B – Automatic Identification System (AIS) Information
- Exhibit C – Vessel Transit Summary Compiled from 2019 AIS Data
- Exhibit D – Cape Fear Boat Works 2019 Vessel Log
- Exhibit E – Outreach Log
- Exhibit F – CSXT's Bridge Lift Logs for the Navassa Drawbridge

NIR Wilmington Harbor

- Exhibit A – Conceptual Engineering Drawing for the Proposed Railroad Bridge
- Exhibit B – NCDOT's Express Design Summary for the Replacement of the Cape Fear Memorial Bridge (US 74/76)
- Exhibit C – Hydrographic Surveys
- Exhibit D – Vessel Summary Compiled from 2019 AIS Data & Bridge Lift Log Data
- Exhibit E – Automatic Identification System (AIS) Information
- Exhibit F – City of Wilmington Facilities Docking Usage Statistics 2003 – 2019
- Exhibit G – USACE 2019 Cargo & Trip Reports Northeast (Cape Fear) River, NC
- Exhibit H – Outreach Log

Project Background

As previously stated in the City's PIR letter dated February 9, 2021, the primary purpose of the Project is to improve safety, regional mobility and freight rail operations, while also improving the resiliency,

reliability, and operational fluidity of the sole freight rail route connecting southeastern North Carolina with the Port of Wilmington (Port). The challenges the City of Wilmington faces with rapid population growth and increasing traffic congestion combined with increases in freight movement through the Port will strain the existing transportation network if it is not enhanced. As such, the City is proposing a new route to bypass the existing freight rail route between the railyard in Navassa, NC (Davis Yard) and the Port which would eliminate 32 at-grade railroad crossings.

The Federal Railroad Administration (FRA) is the lead agency for the implementation of the National Environmental Policy Act (NEPA). Environmental documentation in the form of an Environmental Assessment is currently under development for the Project. A preferred route alternative has not yet been selected, but two of the six alternatives studied have been short-listed for further consideration as Preferred Alternatives. Public comments were solicited as part of an Alternatives Analysis Report and the project team is in the final stages of recommending a Preferred Alternative.

Approach to NIRs

To enhance planning efforts for the Project the City has endeavored to progress NEPA and USCG's bridge permit process concurrently. The City's hope is to have preliminary navigational clearances inform early engineering design efforts for the Preferred Alternative. Given the modest grade elevations which can practically be achieved in railroad design (+/- 1%), preliminary navigational clearances are expected to heavily influence other important engineering considerations such as the vertical alignment, fixed structure design and moveable span bridge design.

The Project contemplates two moveable span bridges over the Cape Fear River. Each of two sections of the Cape Fear River being traversed by the proposed bridges are materially different from one another with respect to waterway usage despite being within one and a half river miles of each other. Consequently, the City has prepared two separate NIRs so as to accurately reflect the particular waterway characteristics at each proposed bridge location.

Public outreach and stakeholder collaboration has been a cornerstone of the Project from its inception. The City seeks to create feedback loops with the public as Project development progresses with the intent of having public comment inform the process. As it relates to the NIRs, the City posted draft versions of the documents online and solicited comments from both the maritime community and general public. Stakeholder coordination took place throughout the development of the NIRs and culminated with a 30 day comment period. The City advertised the opportunity to provide feedback via direct communications with numerous stakeholders, issuing a press release which generated media coverage, advertising on various social media platforms, presenting at public meetings and various other means of traditional advertisement.

To compliment and inform the collaboration with stakeholders, the City also relied upon a number of data sources. The two primary data sources utilized for both NIRs were Automatic Identification System (AIS) data made available by marinecadastre.gov for coastal planning purposes and bridge lift logs. Due to the widespread impacts of COVID-19, the City used 2019 data in lieu of 2020 data as it was believed that 2020 data would not represent normal usage.

Cape Fear River Above Wilmington NIR - Key Findings & Considerations

One of the two proposed bridges is to be located on a lightly used portion of the waterway which is referred to by the Army Corp of Engineers as the Cape Fear River Above Wilmington. Because the decision on a Preferred Alternative is still pending, a precise location for the proposed bridge has not yet been determined. However, all alternatives currently being evaluated for the Project are between existing upstream and downstream structures which in aggregate constrain navigational clearances to 102 feet horizontal and 55 feet vertical with the upstream movable span in the open position and nine

feet when the upstream structure is in the closed position. Proximity to existing structures, waterway geometry, waterway characteristics and atmospheric conditions are not expected to differentiate the two proposed bridge locations (route alternatives) which remain under consideration.

AIS data showed only 11 vessels having traversed the proposed bridge location in 2019. An interview with the Cape Fear River Pilots Association (Pilots) revealed that there are no current or prospective commercial freight movements on the waterway. There are regular commercial tourist operations - conducted by Cape Fear Riverboats, Inc. and Wilmington Water Tours, LLC - that traverse the proposed bridge locations. These tours depart from downtown Wilmington and typically traverse the S Thomas Rhodes Bridge but stop short of the CSXT Navassa Drawbridge. The Pilots and others also stated that there are limited recreational users on this section of the river citing some small craft in-shore fishing.

The City also conducted an interview and exchanged correspondence with the Cape Fear Boat Works, the only marine facility upstream of the proposed bridge locations and the primary draw for large vessels. All vessels inbound or outbound from the Cape Fear Boat Works Facility must traverse both of the existing bridges on the waterway, and are thus constrained by the aforementioned existing navigational clearances. Cape Fear Boat Works generously provided its 2019 log of vessels that visited the facility which shows at least 64 unique vessels transited the waterway during 57 calendar days with the most vessels in any one calendar day being five. The CSXT bridge log for the Navassa Drawbridge upstream of the proposed bridge location showed 231 openings in 2019 with the most openings in any one day being four. Expectations for train frequency over the proposed bridge are between two and six trains per day during the planning horizon (2021 - 2040).

Given the information obtained during the course of completing the NIR, the Project team proposes a moveable, single leaf bascule bridge with a horizontal navigational clearance of 102 feet, an unlimited vertical navigational clearance in the open position and a vertical clearance of nine feet in the closed position, all of which will match the existing upstream railroad bridge (CSX's Navassa Drawbridge) and preserve the current navigational envelope of the waterway.

Wilmington Harbor NIR – Key Findings and Considerations

The location for the second proposed bridge is immediately south of the US 74 / 76 highway bridge across the Cape Fear River known as the Cape Fear Memorial Bridge (CFMB). Even though a Preferred Alternative (route) has not yet been identified for the Project, the proposed bridge location is relatively known because it remains constant across all six route alternatives under consideration. The proposed location of the bridge was primarily driven by coordination with the North Carolina Department of Transportation's (NCDOT) planned replacement of the CFMB. Four options were considered by NCDOT for the replacement of the CFMB. One of the four options from the feasibility study includes an independent rail superstructure adjacent to the highway structure, both of which would be supported by a shared substructure. The Project team located the proposed bridge so as to be compatible with all of NCDOT's feasibility study options for the replacement of the CFMB, which is to say the proposed bridge location presented in the NIR is expected to be compatible with the replacement of the CFMB as either a stand-alone railroad bridge or as dual mode bridge.

Downstream of the proposed bridge location lie a number of commercial users, the largest of which is the North Carolina State Port Authority's Port of Wilmington. The Port sees the largest vessels in the area, but these vessels do not operate further north than the turning basin, which is located approximately one mile downstream of the proposed bridge site. Between the proposed bridge location and the turning basin are two facilities receiving commercial freight vessels – Buckeye Terminal and Colonial Terminal – however, these vessels never transit the CFMB. Coordination with the Pilots and AIS data substantiate this assertion.

The AIS data, which was vetted in collaboration with the Pilots, revealed that the 28 largest vessels traversing the existing CFMB were all commercial freight vessels serving a single facility upstream. These vessels were far and away the largest vessels in the dataset, and would thus dictate the proposed preliminary horizontal and vertical navigational clearances. Between this commercial facility and the CFMB are two other existing moveable span bridges limiting navigation on the waterway – both have posted clearances of 200 feet horizontal, both provide unlimited vertical clearance in the open position, one bridge rests in the open position and the other rests in a closed position providing 40 feet of vertical navigational clearance.

The existing horizontal navigational clearance for the CFMB is 350 feet, but with the knowledge that the largest vessels using the waterway were also traversing horizontal navigational clearances of 200 feet upstream, the Project team began to assess the practicability of recommending a horizontal clearance of 200 feet for the proposed railroad bridge. The primary engineering consideration for the bridge was initially the horizontal clearance since this variable would heavily influence the design choice for moveable span type (i.e., bascule vs. vertical lift span). Related to navigation, the choice between a bascule type span and vertical lift span meant the difference between the proposed bridge imposing or not imposing a vertical clearance constraint. Compounding the influence of the horizontal clearance consideration was the finding, based upon extensive research by the Project team, that bascule bridge types in freight rail applications in North America have a practical limitation of 200 to 220 feet.

Prior to recommending a horizontal navigational clearance, waterway characteristics and geometry specific to the proposed bridge location were collaboratively evaluated by the Pilots, the Project's lead engineer and the City. During the evaluation it was noted that the curvature of the channel immediately upstream of the proposed bridge location is approximately 15 degrees more severe than the curvature of the channel further upstream where the existing structures with 200 foot horizontal navigational clearances are located. Under non-ideal atmospheric or hydraulic conditions (i.e. high winds or opposing currents, tides) additional horizontal clearance beyond 200 feet was recommended at the proposed bridge location to compensate for the waterway's geometry and to maintain a reasonable margin of safety for the operation of large commercial vessels. Thus, a recommendation for a vertical lift span bridge with 250 feet of horizontal clearance and a vertical clearance of 135 feet (to match the existing vertical clearance of the CFMB) is proposed in the NIR. The Project team also proposes resting the bridge's moveable span in a position which allows for a vertical clearance of 40 feet, matching the Isabel Holmes Bridge upstream. The moveable span would be lowered approximately two to four times per day for train traffic limiting the vertical navigational clearance to 20 feet, and would be raised to 135 feet an estimated average of one time per day (400 times per year) to allow for vessel transits.

Thank you for your time, attention and collaboration thus far with the Project. The City looks forward to receiving your response and continuing to work with USCG throughout the bridge permit application process. Please contact me any time if you have questions or if additional information is required. I can be reached by email at aubrey.parsley@wilmingtonnc.gov or by phone at (910) 200-8382.

Respectfully Submitted,

Aubrey Parsley, PE
Director of Rail Realignment
City of Wilmington

NAVIGATION IMPACT REPORT

for the Rail Realignment Project
Cape Fear River Above Wilmington

Completed by the City of Wilmington
Aubrey Parsley, PE
Director of Rail Realignment
305 Chestnut Street, PO Box 1810
Wilmington, NC 28402

September 24, 2021

A. Means of data collection:

The primary sources of waterway user data were a bridge lift log, a marine facility vessel log and Automatic Identification System (AIS) datasets from 2019 which were analyzed and refined for the purposes of this report by the City of Wilmington in collaboration with MarineCadastre.gov (a collaboration between the Bureau of Ocean Management (BOEM) and the National Oceanic and Atmospheric Administration (NOAA)). Additional information was gathered via direct outreach from known stakeholders with navigational interests, users of the relevant waterway as well as from other publically available sources.

- AIS Data for 2019 (Exhibit C) (https://coast.noaa.gov/htdata/CMSP/AISDataHandler/2019/index.html)
- Bridge lift logs (Exhibit F)
- Marine facility vessel log (Exhibit D)
- USGC's National Vessel Documentation Database Queries via NOAA website
- On-site visits
- Outreach to various government, private and public stakeholders (see Exhibit E)
- Comment period between June 28th and July 26th, 2021 which was publicized via press release, newspaper advertisement, social media applications, flyers, mailers, local government meetings and on television
- Other resources as made available online (specific citations made in each section)

B. Present governing bridge(s) or aerial structure(s) on the waterway:

1. *Identify all bridges upstream and downstream of the proposed bridge site and their existing horizontal and vertical clearances to determine the existing minimum horizontal and vertical clearances (including overhead transmission line clearances). Provide in table format.*

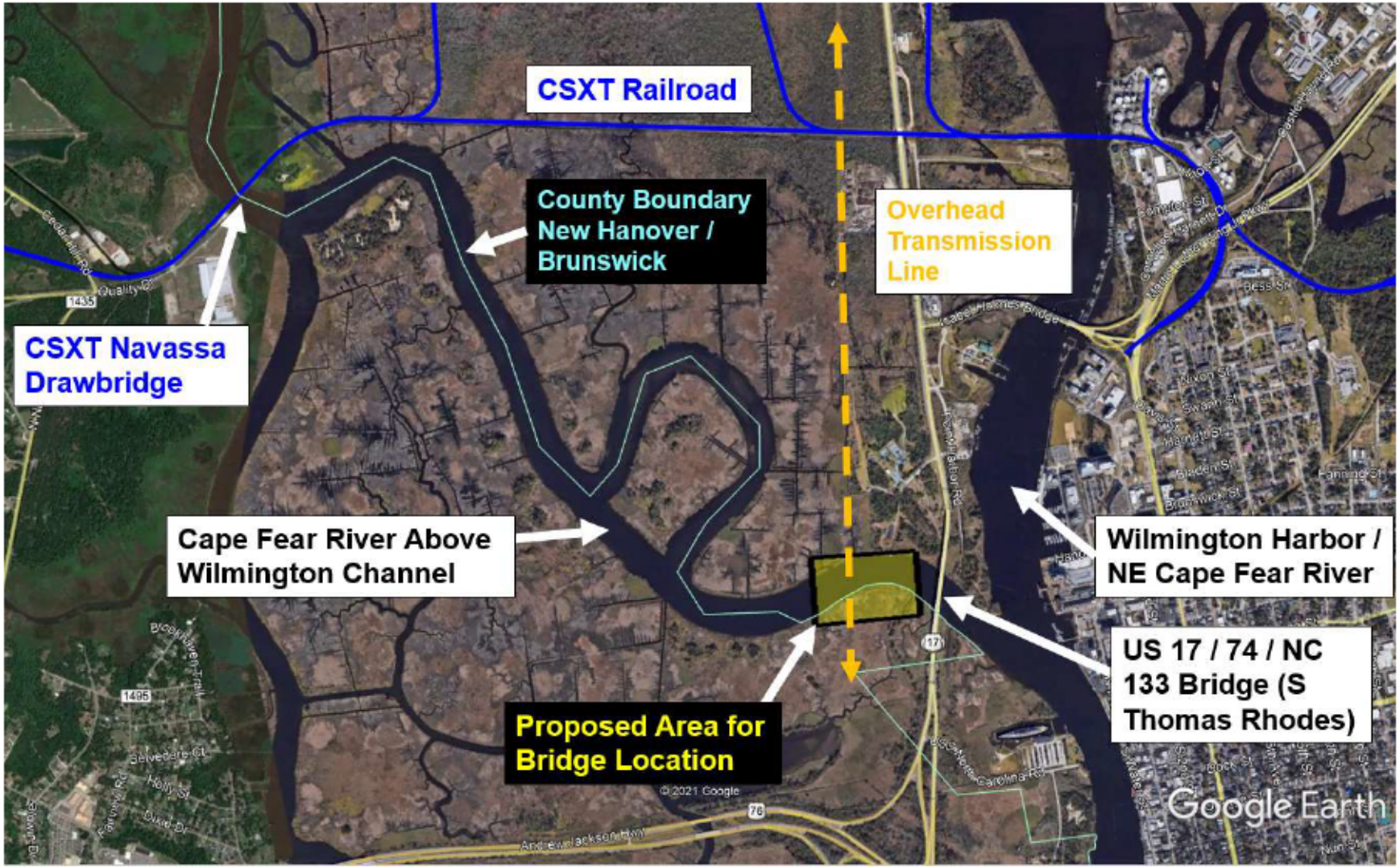
(If all bridges downstream have the same minimum clearance, state instead of the above requested information).

TABLE 1:

Facility Carried	Feature Intersected	Approx. Waterway Milepoint	Channel Depth (MHW)	Vertical Clearance (MHW)	Horizontal Clearance
CSXT SE Line Navassa Drawbridge	Cape Fear Above Wilmington	34	12'	9' closed Unlimited open	102'
Overhead Transmission Line	Cape Fear Above Wilmington	30.3	25'	125'	Full channel
US 17 / 74 / NC 133	Cape Fear Above Wilmington	30	25'	55'	120'

See also Figure 1 on the following page.

FIGURE 1:


CSXT Railroad
County Boundary New Hanover / Brunswick
Overhead Transmission Line
CSXT Navassa Drawbridge
Cape Fear River Above Wilmington Channel
Wilmington Harbor / NE Cape Fear River
US 17 / 74 / NC 133 Bridge (S Thomas Rhodes)
Proposed Area for Bridge Location
© 2021 Google
Google Earth

2. *Does the proposed bridge(s) match (or is greater than) the navigational clearance of the existing structures on the waterway?*

   There are currently two (2) location alternatives being considered for the proposed bridge crossing of the Cape Fear River between waterway mile points 30.2 and 30.3. The two (2) locations being considered are (approximately) located at waterway mile point 30.2 and 30.3. Each of these alternative locations would place the proposed bridge between the US 17 / 74 / NC 133 fixed highway bridge and the CSXT SE line moveable bascule railroad bridge commonly referred to the as the CSXT Navassa Drawbridge. The horizontal and vertical navigational clearances proposed below would be incorporated at either of the aforementioned locations (see also Figure 3 below) and are expected to reasonably meet navigational needs of the waterway.

Horizontal Clearance:	102 feet matching the CSXT Navassa Drawbridge upstream
Vertical Clearance:	Unlimited in the open position, 9 feet closed, matching the CSXT Navassa Drawbridge upstream

3. *What is the most restrictive horizontal clearance on the waterway? (This may be a fixed bridge downstream/upstream of the proposed structure, a low hanging power line downstream/upstream of the bridge(s), or it may be some other structure that limits horizontal clearance. Sometimes the existing to-be-replaced bridge(s) is the most restrictive structure.*

   Upstream of the proposed bridge location the structure which creates the most restrictive horizontal clearance is the CSXT Navassa Rail Bridge.

   a. Milepoint: 34

   b. Horizontal clearance: 102 feet

   Downstream of the proposed bridge location the structure which creates the most restrictive horizontal clearance is the fixed US 17 / 74 / NC 133 highway bridge.

   a. Milepoint: 30

   b. Horizontal clearance: 120 feet

4. *What is the most restrictive vertical clearance on the waterway? (This may be a fixed bridge downstream/upstream of the proposed structure, a low hanging power line downstream/upstream of the bridge(s), or it may be some other structure that limits vertical clearance. Sometimes the existing to-be-replaced bridge(s) is the most restrictive structure.*

   Upstream of the proposed bridge location the structure which creates the most restrictive vertical clearance is the CSXT SE Line.

   a. Milepoint: 34

b. Vertical clearance (bridge in closed position): 9 feet

c. Vertical clearance (bridge in open position): Unlimited

Downstream of the proposed bridge location the structure which creates the most restrictive vertical clearance is the fixed US 17 / 74 / NC 133 highway bridge.

a. Milepoint: 30

b. Vertical clearance (non-moveable bridge): 55 feet

5. *Will the proposed bridge(s) become the most restrictive/obstructive structure across the waterway?*

No, the proposed bridge will not become the most restrictive structure across the waterway as it will match the clearances of an existing bridge upstream.

C. Waterway characteristics:

(All domestic bridge navigational clearances should be stated in linear feet in decimal form vs. feet and inches. All international bridge navigational clearances should be state in linear unit of measure as well as the metric equivalent).

1. *Various water stages: (Datum that is used).*

The various waterway stages are listed in Table 2 below. All data values are relative to North American Datum of 1988 (NAVD88). Elevations are from National Oceanic and Atmospheric Administration (NOAA) station 8658120 in Wilmington, NC near the Cape Fear Memorial Bridge which is approximately 1.4 river miles from the proposed bridge site(s).

TABLE 2

	Waterway Stage	*Elevation (NAVD88)*
MHHW	Mean Higher – High Water	2.08 feet
MHW	Mean High Water	1.83 feet
MTL	Mean Tide Level	-0.31 feet
MSL	Mean Sea Level	-0.16 feet
DTL	Mean Diurnal Tide Level	-0.26 feet
MLW	Mean Low Water	-2.44 feet
MLLW	Mean Lower-Low Water	-2.60 feet
NAVD88	North American Vertical Datum of 1988	0.00

Source: https://tidesandcurrents.noaa.gov/stations.html?type=Datums

2. *Natural flow of the waterway including currents, waterway velocity, water direction, and velocity fluctuations (seasonal, daily, hourly, etc.), that might affect navigation.*

Tides are normally semi-diurnal on the waterway (2 lows, 2 highs daily cycles on average) and micro-tidal (tidal range < 2 meters). The waterway experiences both ebb and flood tidal flows, with direction and velocity of flow varying with tidal cycles. Generally, water flows east-west until reaching the confluence of the Northeast Cape Fear River and the Cape Fear River.

NOAA performed a Cape Fear River, NC survey in 2016 with results published in June 2019. The report made use of numerous observation stations for data collection, one of which was CFR1604 located at Peter Point within less than 1,000 feet from the proposed bridge location. Speed and timing relative to the tidal day of mean maximum ebb current (MEC) and mean maximum flood current (MFC) at the near surface were:

MFC = 74.8 cm/s (1.45 knots)
MEC = 81.8 cm/s (1.59 knots)

Source:
https://tidesandcurrents.noaa.gov/publications/Techrpt_089_Cape_Fear_Tech_Report_Final.pdf

3. *Width of the waterway at bridge site.*

The width of the waterway at all of the considered bridge sites is approximately 425 feet bank to bank. The width of the navigational channel as maintained by the United States Army Corp of Engineers (USACE) varies from 140 feet wide (upstream of the Navassa Turning Basin) to 200 feet (downstream of the Navassa Turning Basin). The Navassa Turning Basin immediately south of the CSXT Navassa Drawbridge is 400 feet wide by 550 feet long.

4. *Depth of the waterway and elevation fluctuations at bridge site: [List the depth at each waterway bridge stage (ex. Range of tides, average high water elevation, etc.)].*

The depths of the waterway at various stages at the proposed bridge site(s) are depicted in the attached Exhibit A. Generally the depths range from 20 feet to 36 feet within the proposed bridge site(s), with elevations referring to MLW. As seen from data provided in C.1, waterway elevations vary 4.27 feet from MLW to MHW.

The channel has not been dredged within the last 20 years and there are no eminent plans for dredging of the waterway at this time. The channel is occasionally surveyed by USACE. The latest hydrographic survey is attached herein as Exhibit A.

Sources
https://www.saw.usace.army.mil/Missions/Navigation/Hydrographic-Surveys/River-Projects/
https://www.arcgis.com/apps/opsdashboard/index.html#/4b8f2ba307684cf597617bf1b6d2f85d

5. *Waterway layout and geometry: (For example, is there a dam or lock, does the elevation of the approach impact the required bridge(s) clearance?)*

There are no dams, locks, elevation changes or other considerations which would materially impact the required bridge clearances.

The proposed bridge locations fall between what is known as Peter Point and Muddy Point on the Cape Fear River Above Wilmington, which is a federal channel maintained by the USACE. The confluence of the Cape Fear River and the Northeast Cape Fear River is immediately downstream from the proposed bridge sites (at Peter Point) as is the Wilmington Harbor, which is also a federal channel maintained by the USACE. Upstream of the proposed bridge site, immediately south of the Navassa

Rail Bridge, the Cape Fear River partially diverges to form the Brunswick River, which wraps around the west end of Eagle Island, to meet back up with the Cape Fear River further south. The Cape Fear River Above Wilmington navigational channel extends approximately 111 miles from its connection with the Wilmington Harbor Project up to Fayetteville. The section of the waterway considered for bridge site(s) is primarily oriented east-west and has a small bend which is further described under C-6 below.

There are no dams, locks or other considerations which materially impact elevation.

6. *Channel and waterway alignment: Location of the channel(s).*

The proposed bridge would cross a federal channel maintained by the USACE known as the Cape Fear River Above Wilmington. The Cape Fear Above Wilmington channel extends approximately 111 miles from its connection with the Wilmington Harbor Project to Fayetteville, NC. The two bridges described in Table 1 both cross the channel. The channel connects with another federally maintained channel, the Wilmington Harbor, which proceeds for approximately 26 miles south until reaching the Atlantic Ocean.

The Cape Fear River Above Wilmington channel is maintained to a channel depth of 25 feet and a width of 200 feet up to the Navassa Turning Basin. The Navassa Turning Basin is 400 feet wide by 550 feet long and is maintained to a depth of 25 feet. North beyond the Navassa Turning Basin (beginning immediately south of the CSXT Navassa Rail Bridge) the channel is maintained to a width of 140 feet and a depth of 12 feet to just south of the CSXT Navassa Drawbridge. Upstream of the Navassa Turning Basin the channel is maintained to a width of 140 feet to project mileboard 30 (as defined by USACE) near Riglewood, NC with five (5) channel cut-offs that are 150 feet. Beyond Riglewood, the channel is maintained to a depth of 8 feet with varied channel widths.

There is a short bend in the waterway of approximately 70 degree delta which is depicted in Figures 2 & 3 below. Each alternative would present a different orientation of the proposed bridge to the navigational channel and each alternative would cross the waterway at a skew.

FIGURE 2:

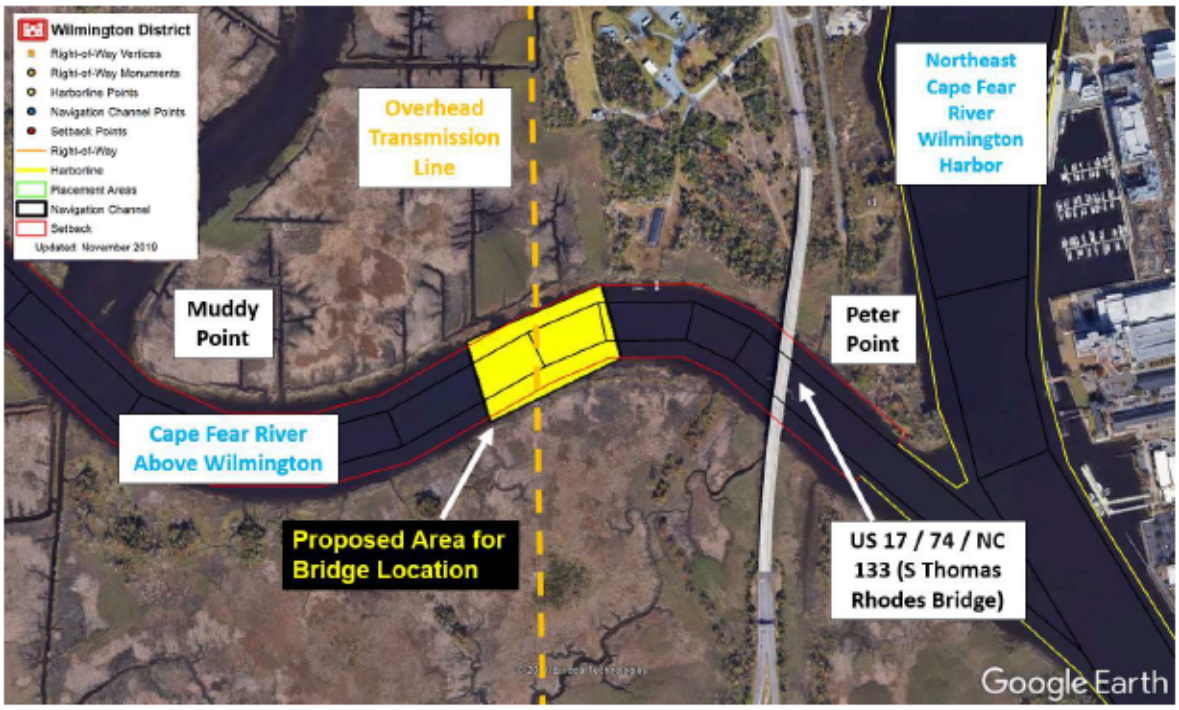
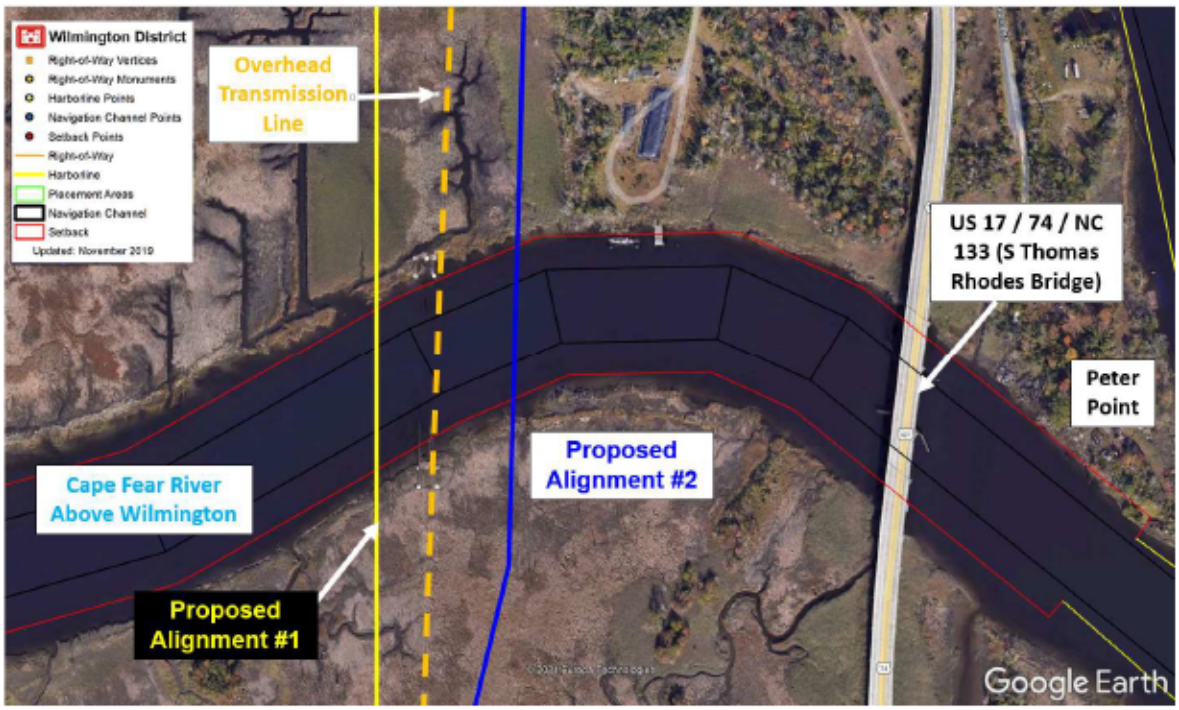


FIGURE 3:



7. *Other limiting factors: (For example, bends in the waterway within one-half mile of the project site, hindrances to free navigation, fog, hydraulics, etc.).*

In addition to the bend in the waterway described and depicted above in C.6, there is another bend to the waterway of approximately 160 degree delta west of the proposed bridge locations. This bend is also depicted in Figure 2 but does not present any meaningful limitations to navigation to current waterway users at the proposed bridge locations.

There are no other known hindrances to free navigation within one-half mile of the proposed bridge sites. See NOAA Chart 11537 and appendices for additional information.

D. Do vessels that engage in emergency operations (i.e., law enforcement, fire, rescue, emergency dam repair, etc.), national defense activities (i.e. cruisers, fuel barges, munitions ships, etc.) or channel maintenance (i.e., dredges, dam and levee repair, etc.) operate on the waterway? If yes, describe the vessels and provide the following information:

1. *Does levee maintenance, bridge work (other bridges), channel maintenance and emergency operations upstream of bridge require certain vessels to transit the waterway?*

   No, per coordination with the NCDOT, USACE, USCG and other agencies.

2. *Does the proposed bridge(s) impact USCG and/or other government vessels' ability to transit the bridge(s) to conduct mission essential functions (icebreakers, patrols, etc.)?*

   No, per coordination with USCG.

   Coast Guard Station Oak Island is the only Coast Guard unit that has the potential to operate in the area identified within the Rail Realignment Navigation Impact Report. USCG does not have any Aids to Navigation (ATON) in the area that require servicing from ANT Oak Island, CGC Bayberry, or CGC Maple.

   Coast Guard Search and Rescue Station Oak Island generally does not conduct operations between Peter Point (from the S Thomas Rhode bridge, US 17 / 74 / NC 133) to just north of the CSXT Navassa bridge. USCG relies on other government agencies (OGA's) to assist in the area. In the event that they are required to transit north above the Navassa bridge, they would utilize the 29' RBS-II and have do so at low tide or request a bridge opening.

3. *Vessels using the waterway during the proposed bridge(s) lifespan:*

   <u>USCG Oak Island Vessel:</u>

   Vessel did not transit the waterway under study in 2019.

   i. Vessel name: 29' RBS-II

ii. Registration/documentation numbers: CG 29216, CG29217
iii. Vessel type: Enclosed Cabin, outboards
iv. Vessel owner contact information: USCG Station Oak Island
v. Primary vessel mooring location (include waterway milepoint, if known): 300A Caswell Beach Rd., Oak Island, NC 28465
vi. Vessel overall length: 31' 7"
vii. Vessel beam: 8' 5"
viii. Vessel draft (depth of hull below waterline at full load): 2' 9" trimmed down, 1' 10" trimmed up
ix. Vessel air draft (height of the highest fixed point of the vessel above the waterline, when empty): 7' 10"

US Army's Sunny Point, NC firefighting and rescue vessel:

Vessel currently transits the waterway twice per year for scheduled maintenance (and as needed for emergency repairs) at the Cape Fear Boat Works located upstream from the proposed bridge locations. These vessel transits appear in 2019 AIS dataset. Vessel characteristics provided my Military Ocean Terminal Sunny Point (MOTSU).

i. Vessel name: Sunny Point
ii. Registration/documentation numbers: Vessel # CG 1167165, Galdding-Hearn Shipbuilding Hull Number 387
iii. Vessel type: Unclassified vessel, Aluminum, Jet Propulsion
iv. Vessel owner contact information: US Army, Military Ocean Terminal Sunny Point (MOTSU), Fire & Emergency Services Division /Chief Michael Scott / 6280 Sunny Point Rd. Southport, NC 28461 / 910-457-8218
v. Primary vessel mooring location (include waterway milepoint, if known): MOTSU Boat Basin / Buoy # 33 Cape Fear River
vi. Vessel overall length: 82' 6"
vii. Vessel beam: 20' 6"
viii. Vessel draft: 4' 2"
ix. Vessel air draft: 37' 3"
x. Does the vessel have limited maneuverability due to inherit design or mode of operation?: To operate one fire pump the vessel requires 6' of draft, 10' of draft to operate two pumps

4. *Will the proposed bridge(s) provide the horizontal and vertical clearances for the safe, efficient passage of the largest of these vessels? Why?*

   Yes. Horizontal and vertical clearances are no more restrictive than structures over the waterway which are presently transited by these vessels.

5. *If no, estimate the number of vessels in each of the above categories unable to pass through the proposed bridge(s). Give the name, length overall (LOA), beam, draft and height of highest fixed point above the waterline for vessels affected by the bridge(s).*

   Not applicable.

6. *Can these vessels be modified (i.e., folding mast, relocation or equipment, etc.) without decreasing their respective response times? If so, name the vessels.*

   Not applicable.

7. *If modifications are feasible, state the name of the vessel(s), their trip frequency, the necessary modifications, the cost of the modification(s) and who will pay for them (i.e., vessel owner, applicant, other).*

   Not applicable.

8. *Provide any additional information concerning the potentially impacted or burdened users of the waterway as well as the future use of the waterway.*

   Not applicable.

E. Has the United States Corps of Engineers (USACE) completed or does it plan to complete a federal navigation project on the waterway? If yes, provide the following information:

Yes, USACE has completed a federal navigation project on the waterway.

1. *Project name, downstream/upstream milepoints, depth, type of project, scope, status of project and other limiting factors.*

   Project Name: Cape Fear River Above Wilmington

   Milepoints: 0.0 at the connection with the Wilmington Harbor Project
   111 near Fayetteville, NC

   Depth: See Exhibit A

   Type: Federal Navigation Channel

   Status: Complete

2. *Whether there is/was a "design vessel" used in planning the channel? What is/was the design vessel? Was the design vessel reviewed by the Coast Guard?*

   No "design vessel" was identified for the navigation project.

3. *The following specification of the vessel for which the navigation project is or will be designed: LOA, beam, draft and height of the highest fixed point above waterline.*

   Not applicable.

4. *Will the proposed bridge(s) provide the horizontal and vertical clearances necessary for the safe, efficient passage of the vessel for which the navigation project was designed?*

   Not applicable.

5. *If so, can the vessel be modified to clear the proposed bridge(s) without substantially increasing operating costs?*

   Not applicable.

6. *If modifications are feasible, state the necessary modifications, costs of any modifications(s), who will pay for the modifications.*

   Not applicable

7. *Are the projected changes in the waterway usage based upon anticipated waterway improvement projects?*

There are no projected changes for waterway usage based upon any waterway improvement projects.

8. *Does the proposed bridge impact USACE ability to transit the bridge in a Federal project channel?*

   No, the proposed bridge will not impact USACE ability to transit waterway.

F. Describe the present and prospective recreational navigation:

Will the proposed bridge(s) affect the safe, efficient movement of any segment of the present or prospective recreational fleet operation on the waterway? If yes, provide the following information:

Based on the analysis of 2019 AIS data (see Exhibits B & C) and direct outreach to stakeholders along the waterway (see Exhibits D & E), the proposed bridge will not affect the safe, efficient movement of any segment of present or prospective recreational operations on the waterway.

Analysis of AIS data revealed that there are no regular recreational users of the waterway which are equipped with AIS technology.

G. Describe the present and prospective commercial navigation and the cargoes moved on the waterway:

Will the proposed bridge(s) affect the safe, efficient movement of any segment of the present or prospective commercial fleet operating on the waterway? If yes, provide the following information:

Based on the analysis of 2019 AIS data (see Exhibits B & C) and direct outreach to stakeholders (see Exhibit D) along the waterway, the proposed bridge will not affect the safe, efficient movement of any segment of present or prospective commercial fleet operations on the waterway.

Analysis of the AIS data revealed that there are no commercial vessels equipped with AIS equipment which regularly transited the subject waterway in 2019.

There are a number of passenger vessels operating sight-seeing tours departing from downtown Wilmington that make use of the subject portion of the waterway. Vessels which are currently in operation include:

- Wilmington
  - Offers cruises which transit the waterway
  - 46' length, 16.8' beam, 5.5' depth and 17.5' air draft
- Bizzy Bee
  - Does not currently offer cruises which transit waterway
  - 34.5' length, 12.2' beam, 5' depth
- Captain J.N. Maffit

- 49' length, 13' beam, 4.8' depth (listed)
- Air draft greater than 9 feet (based on observation)

- Henrietta III
  - 149.5' length, 34' beam, 7' depth (listed)
  - Air draft greater than 9 feet (based on observation)

The Wilmington is presently the only vessel which is known regularly traverse the subject portion of the waterway for its "Eagles Island" tour. The Henrietta III and Captain J.N. Maffit are available for private charter and infrequently transit the waterway.

Furthermore, the AIS data for 2019 shows two research vessels having transited the waterway, collectively, six (6) times. Both vessels are owned and operated by the University of North Carolina Wilmington (UNCW). Vessel characteristics are as follows:

- R/V Seahawk
  - 65' length, 21' beam, 6.5' depth

- R/V Cape Fear
  - 34' length, 12' beam, 3' depth

Based on numerous stakeholder interviews conducted (see Exhibit E), the only other commercial vessels which would transit this section of the waterway would do so for maintenance or repair calls to Cape Fear Boat Works (see vessel log in Exhibit D).

H. Identify the name and contact information for marine facilities located within a 3-mile radius of the proposed project (public boat ramps, marinas or major docking facilities, boat repair facilities, etc.

Mr. Sam Long
Owner
Cape Fear Boat Works1690 Royster Rd NE
Navassa, NC 28451
(910) 371-3460
info@capefearboatworks.com
https://capefearboatworks.com/

I. Will the proposed bridge(s) block access of any vessel presently using local service facilities (i.e., repair shops, parts distributors, fuel stations)? If yes, provide the following information:

The proposed bridge will be no more restrictive to vessels presently using the waterway to access the sole marine service facility.

J. Are alternate routes bypassing the proposed bridge(s) available for use by vessels unable to pass the proposed bridge(s)? If yes, provide the following information:

No.

K. Will the bridge(s) prohibit the entry of any vessels to the local harbor of refuge? If yes, describe the harbor and provide the following information:

No. Cape Fear Boat Works acts as a harbor of refuge for customers during storm events. As previously discussed, the proposed bridge would not prohibit entry or further restrict navigation to or from Cape Fear Boat Works.

L. Will the proposed bridge(s) be located within one-half mile of a bend in the waterway? If yes, describe the bend and provide the following information:

Yes, the proposed bridge site(s) are located in or near a bend of the waterway.

1. *Is there sufficient distance between the bridge(s) and the bend to allow proper vessel alignment for the safe, efficient passage of vessels through the proposed bridge(s)?*

   Yes, there is sufficient distance between the bridge and the bend to allow proper vessel alignment for safe and efficient passage of vessels through the proposed bridge. However, each of the two (2) proposed alternatives present varied skews and orientations to the waterway.

2. *If no, what factors make construction of the bridge(s) at an alternate location impractical?*

   Not applicable.

M. Are there other factors (i.e., dockages, lightering areas, existing bridges, etc.) located within one-half mile of the proposed bridge(s), which would create hazardous passage through the proposed structure? If yes, provide the following information:

1. *Describe the factors. (For example, construction impacts to navigation and waterway users, etc.)*

The S Thomas Rhodes Bridge (US 17 / 74 / NC133 highway bridge) is located within one-half mile of the proposed bridge but is not expected to create a hazardous condition for passage through the proposed bridge.

No other factors have been identified which are located within the navigable waterway within one-half mile of the proposed bridge.

2. *What mitigative measures are being recommended? (For example, navigation safety during construction, etc.) Why?*

Not applicable.

N. Do local hydraulic conditions (i.e., wave chop, cross currents, tides, shoals, etc.) increase the hazard of passage through the proposed bridge(s)? If yes, provide the following information:

Local hydraulic conditions are not expected to increase the hazard of passage through the proposed bridge. The proposed site is protected from wave chop. Currents are generally expected generally align with passage through the proposed bridge. Stakeholder interviews revealed the proposed locations for the bridge to be relatively ideal with respect to hydraulic conditions. The last USACE hydrographic survey did not depict any shoaling which would impact the proposed location(s).

O. Do local atmospheric conditions (i.e., strong, prevailing winds, fog, rapidly developing storms, etc.) increase the hazard of passage through the proposed bridge(s)? If yes, provide the following information:

No, it is unlikely the proposed bridge will increase the hazard of passage due to local atmospheric conditions.

1. *Describe the conditions:*

No conditions were identified.

2. *What mitigative measures are being recommended? Why?*

Not applicable.

P. Have guide clearances been established for the waterway? If yes, provide the following information:

Yes, guide clearances have been establish for the waterway. The proposed bridge site is located at or near waterway milepoint 30.

TABLE 3:
Cape Fear River, NC:

No.	Waterway	Bridge Type	Horizontal Clearance	Vertical Clearance	Reference Plane
25	Wilmington mile 30 to mile 39	Fixed or vertical Lift	120'	135'	Maximum HW
		Swing or bascule	120'	10' (closed)	

25	Mile 39 to Fayetteville	Fixed or vertical Lift	100'	70'	Maximum HW
		Swing or bascule	100'	5' (closed)	

Source: https://www.dco.uscg.mil/Our-Organization/Assistant-Commandant-for-Prevention-Policy-CG-5P/Marine-Transportation-Systems-CG-5PW/Office-of-Bridge-Programs/Bridge-Guide-Clearances/

3. *Horizontal guide clearance;*

See Table 3 above.

4. *Vertical guide clearance;*

See Table 3 above.

5. *Do the proposed bridge(s) clearances differ from these guide clearances?*

Yes, the proposed bridge clearance differ from guide clearances.

6. *If yes, what factors justify deviating from these guide clearances?*

The proposed horizontal and vertical navigational clearances for the proposed bridge will be no more restrictive to vessels than existing structures over the waterway, thus reasonably accommodating navigational needs.

Q. Are there other natural or man-made conditions that affect navigation (atmospherics, exclusion zones, etc.)?

There are no natural or man-made conditions that are known which affect navigation

1. *Describe the conditions:*

The channel is maintained by USACE.

2. *What mitigative measures are being recommended? Why?*

None at this time.

R. State any other factors considered necessary for the safe, efficient passage of vessels through the proposed bridge(s)? Are clearance gauges needed? Why?

Fixed navigational lighting on the bridge to indicate channel perimeters. Clearance gauges will be used as a safety precaution. Information on the final bridge would be provided for inclusion in the US Coast Pilot and during construction through Notices to Mariners and other standard maritime information methods.

Regarding the efficient passage of vessels through the proposed bridge, consideration should be given to the resting position and operating rules of the proposed moveable span bridge at later stages in project development. Train traffic over the proposed bridge is expected to be between two (2) and six (6) trains per day for the project's planning

horizon of 2021 through 2040. Two precedents exist in the area today. The CSXT Navassa Drawbridge currently rests in the closed position, opening as needed for vessel traffic and (at present) allowing between two (2) and eight (8) freight trains per day to cross the bridge without a bridge movement. Precedent also exists in the area on the Northeast Cape Fear River where the CSXT Hilton Bascule Bridge rests in the open position allowing for the free flow of vessel traffic and closing for (at present) between two (2) and six (6) freight trains per day. The estimated time that a train would take to traverse the proposed bridge would be 5 to 15 minutes dependent upon train length and multitude of other variables.

S. Include a description of the impacts to navigation caused or which could be reasonably caused by the proposed bridge(s) including but not limited to: proposed construction methodology, proposed or prospective changes to the existing bridge(s) operating schedule (for movable bridges), and any proposed mitigation to all unavoidable impacts to navigation.

1. Conduct a navigational impact report, and include a review of all bridges upstream and downstream of the proposed site to determine the minimum vertical and horizontal clearances available on the waterway.

See Section B above.

2. If the proposed bridge is fixed, and is replacing an existing drawbridge with unlimited vertical clearance, the applicant must determine whether the proposed bridge will accommodate existing and prospective navigation.

Not applicable. Proposed bridge would be an additional structure, not a replacement and is also proposed as a moveable span bridge which will allow unlimited vertical navigational clearance in the open position.

T. Is there any proposed or completed mitigation for impacted waterway users? Are there any impacts that cannot be mitigated?

No impacts to waterway users have yet been identified. Mitigation efforts are not proposed.

EXHIBIT A
Hydrographic Survey

For highest quality river survey imaging, please visit:

https://www.saw.usace.army.mil/Missions/Navigation/Hydrographic-Surveys/River-Projects/

See "Cape Fear River Above Wilmington Surveys" header and select the PDF file link under the title "CAPE FEAR RIVER ABOVE WILMINGTON – Cape Fear River to Lock and Dam 1" with survey date "MAY 3 & 6, 2016".

EXHIBIT B
Automatic Identification System (AIS) Information

The automatic identification system (AIS) is an automatic tracking system that uses transceivers on vessels to track their positions to enable safer navigation and enhance reporting. AIS data is available to the public and is advertised for use for planning purposes. With tools and assistance from MarineCadstre.gov the AIS data can used to display vessel traffic characteristics and frequencies.

For the purposes of this report, the last full year of available AIS data was used which was 2019.

Use of AIS data in assessing recreational and commercial waterway usage is fitting given the requirements set forth in Code of Federal Regulations, Title 33 § 164.01(b) which, in summary, require AIS carriage on the following vessels:

- A self-propelled vessel of 65 feet or more in length, engaged in commercial service.
- A towing vessel of 26 feet or more in length and more than 600 horsepower, engaged in commercial service.
- A self-propelled vessel that is certificated to carry more than 150 passengers.
- A self-propelled vessel that carries less than 150 passengers, does not operate in a Vessel Traffic Service or Vessel Movement Reporting System area defined in Table 161.12(c) of § 161.12, and does not operate at speeds in excess of 14 knots.
- A self-propelled vessel engaged in dredging operations in or near a commercial channel or shipping fairway in a manner likely to restrict or affect navigation of other vessels.
- A self-propelled vessel engaged in the movement of (1) certain dangerous cargo as defined in subpart C of part 160 of this chapter, or (2) flammable or combustible liquid cargo in bulk that is listed in 46 CFR 30.25–1, Table 30.25–1.
- Fishing industry vessels

Source: https://www.navcen.uscg.gov/?pageName=AISRequirementsRev
Title 33, Code of Federal Regulations Section 164

EXHIBIT C

Vessel Transit Summary Compile from 2019 AIS Data

Vessel Name	VesselGroup	Transit	MMSI	TrackStartTime	TrackEndTime	Length	Width	Draft
TWOCAN	Pleasure Craft/Sailing	S Thomas Rhodes Bridge & CSXT Navassa Rail Bridge	367066460	2019-05-14 23:46:18	2019-05-16 10:26:09	12’	4’	NA
FOREVER YOUNG	Pleasure Craft/Sailing	S Thomas Rhodes Bridge	338183911	2019-07-06 10:02:46	2019-07-06 19:09:12	15’	NA	NA
BILL SLAYER	Pleasure Craft/Sailing	S Thomas Rhodes Bridge	338115176	2019-08-13 9:07:37	2019-08-17 7:55:53	14’	5’	NA
BELLE	Pleasure Craft/Sailing	S Thomas Rhodes Bridge	368094510	2019-08-19 17:43:42	2019-08-19 18:40:41	NA	NA	NA
NEVER MY LOVE	Pleasure Craft/Sailing	S Thomas Rhodes Bridge & CSXT Navassa Rail Bridge	367795830	2019-08-28 11:45:45	2019-08-28 12:46:45	74’	21’	8.5’
JOURNEY	Pleasure Craft/Sailing	S Thomas Rhodes Bridge & CSXT Navassa Rail Bridge	338304133	2019-09-03 8:37:18	2019-09-05 14:01:48	17’	7’	NA
NEVER MY LOVE	Pleasure Craft/Sailing	S Thomas Rhodes Bridge & CSXT Navassa Rail Bridge	367795830	2019-09-19 17:32:10	2019-09-19 18:11:08	74’	21’	8.5’
ESCAPE	Pleasure Craft/Sailing	S Thomas Rhodes Bridge & CSXT Navassa Rail Bridge	338180905	2019-09-20 13:52:55	2019-09-26 12:40:55	15’	5’	NA

JOURNEY	Pleasure Craft/Sailing	S Thomas Rhodes Bridge	338304133	2019-09-24 23:16:03	2019-09-26 12:45:32	17’	7’	NA
NORTH STAR II	Pleasure Craft/Sailing	S Thomas Rhodes Bridge & CSXT Navassa Rail Bridge	338076478	2019-11-26 16:20:34	2019-11-26 20:30:30	20’	6’	2’
STELLA	Pleasure Craft/Sailing	S Thomas Rhodes Bridge	338205201	2019-12-02 13:40:01	2019-12-02 15:57:31	12’	4’	NA
STELLA	Pleasure Craft/Sailing	S Thomas Rhodes Bridge & CSXT Navassa Rail Bridge	338205201	2019-12-27 15:46:55	2019-12-27 17:39:57	12’	4’	NA

EXHIBIT D

Cape Fear Boat Works

2019 Vessel Log with Appended Information

Date	Vessel Name	Manufacturer	Type	Length (ft)	Beam (ft)	Draft (ft)	Deck to Forestay / Bridge Clearance (ft)	Source
01/01/2019	Strike	Pacemaker	Yacht	36	11	NA	NA	57
01/07/2019	Capt JN Maffitt	NA	Passenger	50	NA	NA	NA	38
01/09/2019	Therapy	Silverton	Yacht	45	15	4	17	24
01/15/2019	Sanderson	SeaArk	Motorboat	35	NA	NA	NA	53
02/01/2019	NA	Grady White	Motorboat	37	13	2	11	13
02/01/2019	Independence	Jarrett Bay	Yacht	44	14	4	NA	33
02/19/2019	One More Time	Pursuit	Motorboat	33	NA	NA	NA	50
03/04/2019	NA	NA	Barge	NA	NA	NA	NA	-
03/04/2019	NA	NA	Barge	NA	NA	NA	NA	-
03/06/2019	Atlantis	Hatteras	Yacht	42	14	5	16	21
03/13/2019	Atlantic Star	Camcroft	Commercial Fishing	105	NA	NA	NA	36
03/13/2019	Sea Vee	Sea Vee	Motorboat	43	13	2	NA	55
03/20/2019	Starship	NA	NA	65	NA	NA	NA	-
04/01/2019	Plan B	NA	NA	33	NA	NA	NA	-
04/12/2019	Naute Dawg	Egg Harbor	Yacht	41	15	3	NA	48
04/23/2019	Miss Marie	Trojan	Motorboat	30	12	NA	NA	47
04/26/2019	Lady Gallant	Hatteras	Yacht	68	18	5	23	32
04/30/2019	Lizzi Faye	Choey Lee	Yacht	65	19	4	19	28
05/01/2019	Cosmo	Homemade	NA	52	NA	NA	NA	-
05/01/2019	Serenity	Bavaria	Sailboat	50	15	6	64	12
05/17/2019	Great Escape	Nova	Yacht	44	14	4	17	25

Date	Vessel Name	Manufacturer	Type	Length (ft)	Beam (ft)	Draft (ft)	Deck to Forestay / Bridge Clearance (ft)	Source
05/17/2019	Henrietta	Freeport	Passenger	64	NA	NA	NA	42
05/20/2019	NA	NA	Sailboat	30	NA	NA	NA	-
05/21/2019	Liberty	Watkins	Sailboat	33	10	4	39	6
05/22/2019	Carolina Wisdom	Tollycaft	Yacht	40	13	3	13	17
05/22/2019	NA	NA	Barge	NA	NA	NA	NA	-
05/24/2019	NA	Hatteras	Yacht	60	17	6	15	19
05/28/2019	NA	Hatteras	Yacht	60	17	6	15	20
05/30/2019	R/V Cape Fear	NA	Research Vessel	65	21	7	40	-
06/01/2019	Lady Jane	HI	NA	40	NA	NA	NA	-
06/01/2019	John Knox	NA	Passenger	40	NA	NA	NA	45
06/10/2019	Louisa	Custom	NA	38	NA	NA	NA	-
06/21/2019	Hat Trick	Hatteras	Yacht	34	13	NA	NA	41
06/27/2019	Fair Dinkum	Columbia	Sailboat	28	9	5	34	3
07/01/2019	Estrellita	Monk	Yacht	42	14	3	NA	40
07/01/2019	Outer Marker	Pro Sports	Motorboat	28	10	NA	NA	51
07/02/2019	Alvina Anne	President	Yacht	41	14	3	12	14
07/11/2019	Split	Grampian	Sailboat	30	10	5	37	5
07/17/2019	Karen	Willis	NA	39	NA	NA	NA	-
07/19/2019	Sunny Point	NA	Emergency Response	83	21	4	37	-
07/23/2019	IV Seasons	Four Winns	Motorboat	28	NA	NA	NA	43
07/26/2019	Scattercat	Trojan	Motorboat	32	13	3	13	15
07/31/2019	Sea Urchin	O Day	Sailboat	37	11	5	43	7
08/01/2019	Afraid Knot	Bayfield	Sailboat	29	10	4	36	4
08/02/2019	Prop Fee	Sea Ray	Yacht	54	15	NA	21	31
08/08/2019	Technique	Tektron	NA	32	NA	NA	NA	-
08/09/2019	Sharky	Bayliner	Yacht	41	13	4	13	16
08/12/2019	BACO	Willard	Yacht	36	12	5	16	22
08/27/2019	Baby J	Cabo	Yacht	45	16	5	NA	34

Date	Vessel Name	Manufacturer	Type	Length (ft)	Beam (ft)	Draft (ft)	Deck to Forestay / Bridge Clearance (ft)	Source
08/28/2019	Never My Love	Marlow	Yacht	84	22	5	19	30
09/03/2019	Baby J	Cabo	Yacht	45	16	5	NA	35
09/17/2019	Ava Grace	Hunter	Sailboat	36	11	5	47	8
09/23/2019	Southern Charm	Morlend Cit	NA	53	NA	NA	NA	-
10/02/2019	Mr Popular	Tollycaft	Yacht	44	15	8	13	18
10/04/2019	Ms Kimberly	Mainship	Yacht	34	14	3	16	23
10/09/2019	Partnership	Sea Ray	Yacht	40	13	3	NA	52
10/29/2019	Cypress	Grand Banks	Yacht	32	12	5	19	29
10/31/2019	OI Fat Girl	Viking	Motorboat	35	13	4	NA	49
11/01/2019	Relentless	Viking	Yacht	64	19	5	NA	1
11/01/2019	Lindum Thalia	Tayana	Sailboat	37	12	6	51	9
11/01/2019	North Star II	Offshore	Yacht	62	17	5	18	27
11/01/2019	John Boat	Sonny Briggs	Yacht	52	16	6	NA	44
11/01/2019	Lobster Tales	Trojan	Motorboat	36	14	3	NA	46
11/20/2019	Southern Charm	Morlend Cit	NA	53	NA	NA	NA	-
11/25/2019	Sea Creecher	Hatteras	Yacht	48	15	4	17	26
11/25/2019	Sanderson	SeaArk	Motorboat	35	NA	NA	NA	54
11/27/2019	Diversion	Blackfin	Motorboat	33	11	2	NA	39
12/01/2019	Safari	Garlington	Commercial Fishing	61	18	5	NA	2
12/01/2019	JilliQ	Lagoon	Sailboat	37	20	4	55	10
12/01/2019	Frenchie	Wauquiez	Sailboat	43	14	6	64	11
12/01/2019	Blue Eyed Babe	Sea Ray	Motorboat	29	9	2	NA	37
12/19/2019	The Dean	Chris Craft	Motorboat	25	NA	NA	NA	-
12/27/2019	Stella	Sabre	Sailboat	42	13	NA	NA	56

Sources:

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EXHIBIT E
OUTREACH LOG

Broad outreach requesting information, feedback and comments from the public was conducted between June 28th and July 26th, 2021. Waterway users were asked to complete a survey, however, none were received. This public outreach opportunity was publicized via press releases, press reports, television, newspaper advertisement, social media applications, flyers, mailers and during government meetings open to the public.

Agency & Government Consultations

United States Coast Guard – Fifth District Bridge Office
United States Coast Guard – Waterways Management Division for North Carolina Sector
United State Army Corp of Engineers – Operations Division
MarineCadastre.gov (Bureau of Ocean Management / National Oceanic and Atmospheric Administration)
North Carolina Department of Transportation – Division 3
Military Ocean Terminal – Sunny Point, Fire and Emergency Services
University of North Carolina Wilmington
Town of Navassa
New Hanover County

- Sheriff's Office
- Fire Captain
- Emergency Management

City of Wilmington

- Parks & Recreation
- Police Department
- Fire Department

Other Direct Stakeholder Outreach

Cape Fear River Pilots Association
Cape Fear Boat Works
Specialty Boatworks
Wilmington Water Tours, LLC

EXHIBIT F

CSXT's Bridge Lift Logs for the Navassa Drawbridge

CSX TRANSPORTATION

REPORT OF OPENINGS MADE FOR PASSAGE OF BOATS

DIVISION Florence BRIDGE Navassa

MILEPOST SE 360.8 MONTH April 2021 SHEET ___ OF ___

1 DAY OF MONTH	2 NAMES OF BOATS	3 TIME DRAW OPENED	4 TIME DRAW CLOSED	5 LENGTH OF TIME OPEN IN MINUTES	6 DELAY TO BOATS NO.	6 DELAY TO BOATS MIN.	7 DELAY TO TRAINS NO.	7 DELAY TO TRAINS MIN.	8 UP OR DOWN STREAM	9 REMARKS
24	OPEN - CLOSE	2:21p	3:14p							MC
24	OPEN - CLOSE	3:45p	4:05p							MC
26	OPEN - CLOSE	9:36A	9:58A							MC
26	OPEN - CLOSE	3:01p	3:19p							MC
30	OPEN CLOSE	3:00p	3:15p	15						
31	OPEN - CLOSE	7:40A	7:55A							
31	OPEN - CLOSE	11:00A	11:10A							
1	OPEN - CLOSE	9:15A	9:25A							
	OPEN - CLOSE	11:00A	11:10A							
2	OPEN - CLOSE	1:45p	2:35p							MC
6	OPEN - CLOSE	2:52p	4:16p							MC
8	OPEN - CLOSE	9:40A	9:55A							
8	OPEN - CLOSE	1:46p	3:05p							MC
10	OPEN - CLOSE	5:25p	5:41p							MC
10	OPEN - CLOSE	6:27p	6:43p							MC
12	OPEN - CLOSE	11:20A	11:40A							
13	OPEN - CLOSE	10:50A	11:00A							
13	OPEN - CLOSE	2:43p	5:03p							MC
16	OPEN - CLOSE	10:47A	3:16p							M
16	OPEN - CLOSE	4:21p	4:46p							M
17	OPEN - CLOSE	11:43A	4:26p							MC
19	open - close	2:10	2:20	10						
19	open close	2:30	2:40	10						
20	OPEN - CLOSE	10:10A	10:30A							
20	OPEN - CLOSE	1:00P	1:20A							MC
20	OPEN - CLOSE	1:55p	2:45p							MC
20	OPEN - CLOSE	3:53p	4:32p							MC
21	OPEN - CLOSE	9:46	9:55A							
24	OPEN - CLOSE	3:49p	4:20p							MC
26	OPEN - CLOSE	10:00A	10:30A							
28	OPEN - CLOSE	8:05A	9:05A							

SEE OTHER SIDE

White: Engineer of Bridges
Canary: Division Engineer
Pink: Drawtender's Log

USA TRANSPORTATION

REPORT OF OPENINGS MADE FOR PASSAGE OF BOATS

DIVISION Florence BRIDGE Navassa

MILEPOST SE 360.8 MONTH DEC 2020 SHEET 2 OF 2

1	2	3	4	5	6		7		8	9
DAY OF MONTH	NAMES OF BOATS	TIME DRAW OPENED	TIME DRAW CLOSED	LENGTH OF TIME OPEN IN MINUTES	DELAY TO BOATS NO.	DELAY TO BOATS MIN.	DELAY TO TRAINS NO.	DELAY TO TRAINS MIN.	UP OR DOWN STREAM	REMARKS
20	OPEN - close	1:30P	1:45P							
23	OPEN - Close	11:15A	11:30A							
23	Open - close	1:55p	3:00p							MC
29	OPEN - close	9:25A	9:35A							
30	OPEN - close	11:20A	11:30A							
31	OPEN - close	11:00A	1:15P							
4	OPEN - close	10:00A								
5	OPEN - Close	2:05P	3:01p							MC
5	OPEN - close	4:14p	4:31p							MC
6	OPEN - Close	3:08p	3:35							MC
6	Open - close	3:53p	4:55p							MC
7	OPEN - close	8:35	8:45							
7	OPEN - close	11:25A	12:18P							
7	Open - Close	2:05p	2:35p							MC
7	Open - close	4:14p	5:03p							MC
8	Open - Close	2:33p	2:57p							MC
13	open - close	2:40p	3:00p							MC
14	OPEN - close	9:00A	9:10A							
15	OPEN - close	9:00A	10:00A							MC
15	Open - close	10:10A	12:15p							MC
15	Open - Close	2:30p	3:35p							MC
16	Open - close	1:20p	1:30A							MC
19	OPEN - close	9:00A	9:10A							
19	OPEN - close	12:15P	12:30P							
20	OPEN - close	7:50A	8:00A							
22	open - close	10:50AM	11:00 AM	10						
22	open close	11:35AM	11:45AM	10						
22	open - close	2:02p	2:24p							MC
26	OPEN - close	7:30A	7:40A							
26	OPEN - close	8:30A	8:40A							

SEE OTHER SIDE

White: Engineer of Bridges
Canary: Division Engineer
Pink: Drawtender's Log

CSX TRANSPORTATION

REPORT OF OPENINGS MADE FOR PASSAGE OF BOATS

DIVISION Florence BRIDGE Nav-55A

MILEPOST SE 360.8 MONTH DEC 2020 SHEET 1 OF 2

1 DAY OF MONTH	2 NAMES OF BOATS	3 TIME DRAW OPENED	4 TIME DRAW CLOSED	5 LENGTH OF TIME OPEN IN MINUTES	6 DELAY TO BOATS NO.	6 DELAY TO BOATS MIN.	7 DELAY TO TRAINS NO.	7 DELAY TO TRAINS MIN.	8 UP OR DOWN STREAM	9 REMARKS
07	OPEN - CLOSE	10:20A	10:30A							
29	OPEN - CLOSE	10:11A	12:28P							MC
3	OPEN - CLOSE	2:05P	2:20P							MC
8	OPEN - CLOSE	12:30P	12:46P							
9	OPEN - CLOSE	11:10A	11:20A							
10	OPEN - CLOSE	10:20A	10:45A							
10	OPEN - CLOSE	11:07A	12:00P							
11	OPEN - CLOSE	2:40A	8:02A							
15	OPEN - CLOSE	9:20A	10:08A							
16	OPEN - CLOSE	1:20P	1:30P							
18	OPEN - CLOSE	1:56P	2:32P							MC
23	OPEN - CLOSE	8:55A	9:05A							
25	OPEN - CLOSE	9:55A	10:05A							
25	OPEN - CLOSE	1:55P	3 Cl							MC
26	OPEN - CLOSE	8:56A	10:36A							MC
26	OPEN - CLOSE	11:17A	11:36A							MC
26	OPEN - CLOSE	2:18P	2:40P							MC
27	OPEN - CLOSE	2:22P	5:19P							MC
02	OPEN - CLOSE	1:55P	2:30P							MC
4	OPEN - CLOSE	10:15A	10:25A							
4	OPEN - CLOSE	10:10P	10:20P							
5	Open Close	10:40A	10:50							MC
8	OPEN - CLOSE	10:20A	10:30A							
8	OPEN - CLOSE	10:50A	11:00A							
11	OPEN - CLOSE	10:10A	11:20A							MC
12	Close - OPEN	3:32P	3:44P							
13	OPEN - CLOSE	10:46A	2:15P							MC
16	OPEN - CLOSE	6:36P	7:06P							MC
17	OPEN - CLOSE	1:52P	2:27P							
17	OPEN - CLOSE	2:46P								
17	OPEN - CLOSE	1:00T	1:10T							

SEE OTHER SIDE

White: Engineer of Bridges
Canary: Division Engineer
Pink: Drawtender's Log

CSX TRANSPORTATION

REPORT OF OPENINGS MADE FOR PASSAGE OF BOATS

DIVISION Florence BRIDGE Navassa

MILEPOST SE 360.8 MONTH SEPT 2020 SHEET 2 OF 2

1 DAY OF MONTH	2 NAMES OF BOATS	3 TIME DRAW OPENED	4 TIME DRAW CLOSED	5 LENGTH OF TIME OPEN IN MINUTES	6 DELAY TO BOATS NO.	6 DELAY TO BOATS MIN.	7 DELAY TO TRAINS NO.	7 DELAY TO TRAINS MIN.	8 UP OR DOWN STREAM	9 REMARKS
27	Private - My Angle	1:00p	2:00p							MP
2	Private	12:00A	12:32A							MP
~~28~~	Tow Boat	3:15P	3:35P							MP
23	Open - Close	2:15p	2:28p							MC
06	Open Close	1:40pm	1:50pm							MJ
07	Open - close	9:40A	9:48A							MJ
07	Open - Close	11:13A	11:25A							MC
07	open - close	2:50p	3:05p							MC
11	Open - close	2:30p	2:51p							MC
12	Open - close	9:21A	9:35A							MC
13	Open - close	3:30p	3:57p							MC
17	OPEN - close	8:00A	8:15A							
18	OPEN - close									
19	Open - close	2:10p	2:25p							MC
20	Open - close	1:00p	1:15p							MC
Dec										
1	OPEN - close	9:00A	9:15A							
1	open - close	2:21p	2:41p							MC
2	OPEN - close	11:15A	11:28A							
3	OPEN - close	9:30A	9:45A							
4	open	3:30AM								DJ
4	Open - Close	3:19P	3:51p							MC
7	OPEN - close	8:00A	8:40A							
7	OPEN - close	10:12AM	10:40A							
9	OPEN - close	1:15P	1:26P							
9	OPEN - close	8:15A	8:30A							
11	Open - close	4:52p	5:12p							MC
16	Open - close	1:48p	2:18p							MC
18	open - close	11:25A	3:26P							MC
20	open - close	1:35pm	1:45pm	10						DJ
21	Open close	11:15A	11:30A	DJ						

SEE OTHER SIDE

White: Engineer of Bridges
Canary: Division Engineer
Pink: Drawtender's Log

USA TRANSPORTATION

REPORT OF OPENINGS MADE FOR PASSAGE OF BOATS

DIVISION Florence BRIDGE Navigation

MILEPOST SE 360.8 MONTH JULY 2020 SHEET 1 OF ____

1 DAY OF MONTH	2 NAME OF BOATS	3 TIME DRAW OPENED	4 TIME DRAW CLOSED	5 LENGTH OF TIME OPEN IN MINUTES	6 DELAY TO BOATS NO.	6 DELAY TO BOATS MIN.	7 DELAY TO TRAINS NO.	7 DELAY TO TRAINS MIN.	8 UP OR DOWN STREAM	9 REMARKS
3	LARK	2:10 pm	2:30	—						MJ
4	BOAT	12:43P	12:48P							MS
4	Pleasure Boat	2:00	5:00 p							MP DP
10	TROPIC STAR	2:25	6:30 p							DP
12	Recreation Boats (3)	5:35	5:45 p	10						MP
15	MARLIN	9:00A	9:35A							MP
17	STORM VENTURE	10:36A	10:41A	5						MP
17	WHISTLIN DIXIE	12:01P	12:06	5						MP
21	RAE-ZIN FISH	1:08P	12:18P	10						
22		2:38P								
23	Oil	11:40A	11:50A	10						MP
24	Research Boat	9:20A	9:25	5						MP
24	Blue CABIN CRUISER	12:38	12:48	10						MP
24	~~Boat~~ Crill	2:20P								
30	JOURNEY	12:00pm	12:10	10					Dn	MP
31	Private	1:00P	1:48P	50					UP	MP
31	Tow Boat	2:53	5:30							MP
Aug 1	Private	8:00A	10:30A							MP MP
7	Boat	6:22	6:32	10						MP
7	SAIL BOAT	12:10P	12:20	10						MP
7	TOW Boat/Sail	2:00pm	—						UP	DP
7	TOW Boat		4:00 pm						D	DP
11	Rocking Chair	7:16 A	7:26A	10						MP
11	Bucket List	12:48P	12:46P	5						MP
11	TOW BOAT USA	1:50P	2:00P	10						MP
11	TOW BOAT USA	2:23	2:25	2						MP
12	Kelly Dawn	11:44A	4:01 AM							MP
13	TOW BOAT	2:38P	4:15P							MP
18	TOW BOAT	1:19P	3:6 pm							MP
31	Witchhunt	3:30P	3:50P							MP
1	TOW BOAT	0234P	0234P	5						MP

SEE OTHER SIDE

White: Engineer of Bridges
Canary: Division Engineer
Pink: Drawtender's Log

CSX TRANSPORTATION

REPORT OF OPENINGS MADE FOR PASSAGE OF BOATS 2020 May - June

DIVISION Florence BRIDGE Navassa

MILEPOST SE 360.8 MONTH May 2020 SHEET ___ OF ___

1 DAY OF MONTH	2 NAMES OF BOATS	3 TIME DRAW OPENED	4 TIME DRAW CLOSED	5 LENGTH OF TIME OPEN IN MINUTES	6 DELAY TO BOATS NO.	6 DELAY TO BOATS MIN.	7 DELAY TO TRAINS NO.	7 DELAY TO TRAINS MIN.	8 UP OR DOWN STREAM	9 REMARKS
5/3	maintenance	7:15	7:45p	30						
5/22	Bell	10:10A	10:15A	10						
5/22	Bell	11:12A	1:23	10						
5/22	Norwood	3:44p	3:58	10						
5/23	Pleasure Boat	6:50p	7:00p	10						
5/25	US Tow Boats	1:18p	2:11p	1hr						
6-1	US Tow Boats	4:20	4:40	20						
6-2	LADY Gallant	4:39	4:50	11						
6/3	Venda Kay	11:00A	11:15A	15						
6/8	Sail	11:08A	10:00p	10						
6/11		2:19	2:30	11						
6/15	Boat	9:05A	9:15A	10						
6/17	Boat	8:31	8:34	3						
18	Tropic Star	12:00pm	2:10pm	10						
20	Boat	2:00	2:10	10						
21	recreational	7:25								
22	Boat	7:41								
23	Whistlin Dixie	2:11	2:16	5						
23	Boat	4:35	4:45	10						
24	Boat	9:00A	9:30A	30						
24	Boat	2:54p	3:00p	6						
26	Seas The Day	9:50p	10:00p	10						
26	Miss Maggie	12:15pm	12:25p	10						
28	Recreational	5:17								
29	Boat	7:00A	8:00A	10						
29	Appraisers	2:55pm	3:05p	10						
30	Liberty	2:06p	2:06p	5						
3	[redacted] Boat	9:52A	9:56A	4						
	Boat	12:02p	12:07p	5						

SEE OTHER SIDE

White: Engineer of Bridges
Canary: Division Engineer
Pink: Drawtender's Log

CSX TRANSPORTATION

REPORT OF OPENINGS MADE FOR PASSAGE OF BOATS

DIVISION Florence BRIDGE Navassa

MILEPOST SE 360.8 MONTH March 2020 SHEET 1 OF 1

1 DAY OF MONTH	2 NAMES OF BOATS	3 TIME DRAW OPENED	4 TIME DRAW CLOSED	5 LENGTH OF TIME OPEN IN MINUTES	6 DELAY TO BOATS NO.	6 DELAY TO BOATS MIN.	7 DELAY TO TRAINS NO.	7 DELAY TO TRAINS MIN.	8 UP OR DOWN STREAM	9 REMARKS
14	OPEN - Close	9:55A	10:05A	10					D	
14	OPEN - Close	11:00A	11:10A	10					D	
14	OPEN - Close	2:25P	2:30P	5					D	
14	OPEN - Close	3:55P	3:40P	5					D	
18	OPEN - Close	10:35A	10:45A	10					D	
24	OPEN - Close	10:55A	11:00A	5					D	
26	OPEN - Close	10:30A	10:40A	10					D	
30	Open - Close	950AM	1250PM							MP

SEE OTHER SIDE

White: Engineer of Bridges
Canary: Division Engineer
Pink: Drawtender's Log

CSX TRANSPORTATION

REPORT OF OPENINGS MADE FOR PASSAGE OF BOATS

DIVISION Florence BRIDGE Nav-55a

MILEPOST SE 360.8 MONTH Nov-Dec 20PT SHEET ___ OF ___

1 DAY OF MONTH	2 NAMES OF BOATS	3 TIME DRAW OPENED	4 TIME DRAW CLOSED	5 LENGTH OF TIME OPEN IN MINUTES	6 DELAY TO BOATS NO.	6 DELAY TO BOATS MIN.	7 DELAY TO TRAINS NO.	7 DELAY TO TRAINS MIN.	8 UP OR DOWN STREAM	9 REMARKS
28	OPEN - CLOSE	10:25A	10:30A	5					D	
30	OPEN - CLOSE	11:45A	11:55A	10					D	
2	OPEN - CLOSE	10:55A	11:05A	10					UP	
12	OPEN	11:50A	12:00	10					UP	
17	Open - Close	230	231	1					D	
18	OPEN - CLOSE	12:25P	12:30P	5					UP	
27	OPEN - CLOSE	11:00A	11:05A	5					D	
29	Etc									
3	OPEN-CLOSE	10:55A	10:45A	10					UP	
7	OPEN - CLOSE	1:20P	1:30P	10					UP	
8	OPEN - CLOSE	10:15A	10:25A	10					UP	
9	OPEN - CLOSE	10:20A	10:30A	10					UP	
21	OPEN - CLOSE	9:30A	9:40A	10					UP	
24	OPEN - CLOSE	12:00P	12:30P	30					UP	
26	Etc									
28	OPEN - CLOSE	10:25A	10:30A	5					UP	
28	OPEN - CLOSE	1:45P	1:50P	5					D	
28	OPEN - CLOSE	2:05P	2:10P	5					UP	
28	OPEN - CLOSE	3:20P	3:25P	5					UP	
29	OPEN - Close	1:00P	1:12P	12					D	
30	OPEN - CLOSE	12:40P	12:50P	10					UP	
1	~~Open~~	5:20A								M
3	OPEN - CLOSE	10:20A	10:30A						UP	
6	OPEN - CLOSE	2:20P	2:30P						UP	
8	open - close	11:55A	12:00P						UP	MP
8	open - close	1:34p	1:40p						D	MP
9	close - open	2:00	2:20p							MP
9	close - open	9:20p	9:26p							MP MP
12	OPEN - CLOSE	10:10A	10:15A						D	

SEE OTHER SIDE

White: Engineer of Bridges
Canary: Division Engineer
Pink: Drawtender's Log

CSX TRANSPORTATION

REPORT OF OPENINGS MADE FOR PASSAGE OF BOATS

DIVISION Florence BRIDGE Navassa

MILEPOST SE 360.8 MONTH OCT - Nov 2019 SHEET ___ OF ___

1 DAY OF MONTH	2 NAMES OF BOATS	3 TIME DRAW OPENED	4 TIME DRAW CLOSED	5 LENGTH OF TIME OPEN IN MINUTES	6 DELAY TO BOATS NO.	6 DELAY TO BOATS MIN.	7 DELAY TO TRAINS NO.	7 DELAY TO TRAINS MIN.	8 UP OR DOWN STREAM	9 REMARKS
15	OPEN - CLOSED	10:10A	10:15A	5					UP	
15	OPEN - CLOSE	11:15P	1:00P	5					D	
17	OPEN - CLOSE	9:40A	9:50A	10					UP	
19	OPEN - CLOSE	9:30A	9:40A	10					UP	
19	OPEN - CLOSE	1:50P	2:00P	10					D	
21	OPEN - CLOSE	10:50A	11:00A	10					D	
20	OPEN - CLOSE	2:00P	2:10P	10					D	
23	OPEN - CLOSE	9:30A	9:40A	10					D	
23	OPEN - CLOSE	10:36A	10:46	10					UP	
23	OPEN - CLOSE	9:10P	9:20P	10					D	
25	OPEN - CLOSE	10:20A	10:30A	10					D	
25	OPEN - CLOSE	2:20P	3:30P	10					UP	
28	OPEN - CLOSE	8:20A	8:30A	10					D	
29	OPEN - CLOSE	11:45	11:55	10					D	
30	OPEN - CLOSE	10:20A	10:30A	10					UP	
30	OPEN - CLOSE	2:05P	2:15P	10					D	
31	OPEN - CLOSE	10:55A	11:05A	10					UP	
5	OPEN - CLOSE	1:30P	1:40P	10						
8	OPEN - CLOSE	11:40A	11:50A	10						
20	OPEN - CLOSE	11:00A	11:15A	15						
20	OPEN - CLOSE	12:25P	12:35P	10						
21	OPEN - CLOSE	11:20A	11:30P	10						
23	OPEN - CLOSE	2:33P	2:37P	5						MS
23	OPEN	3:45P	3:55P	10						MS
24	OPEN - CLOSE	1:00P	1:10P	10						
25	OPEN - CLOSE	10:15A	10:20A	5						
25	OPEN - CLOSE	11:50A	11:55A	5						
26	OPEN - CLOSE	10:25P	10:35P	10						
	OPEN - CLOSE	2:05P	2:15P	10						MS

SEE OTHER SIDE

White: Engineer of Bridges
Canary: Division Engineer
Pink: Drawtender's Log

CSX TRANSPORTATION

REPORT OF OPENINGS MADE FOR PASSAGE OF BOATS

DIVISION Florence BRIDGE Nav-55a

MILEPOST SE 360.8 MONTH Aug 2018 SHEET ___ OF ___

1 DAY OF MONTH	2 NAMES OF BOATS	3 TIME DRAW OPENED	4 TIME DRAW CLOSED	5 LENGTH OF TIME OPEN IN MINUTES	6 DELAY TO BOATS NO.	6 DELAY TO BOATS MIN.	7 DELAY TO TRAINS NO.	7 DELAY TO TRAINS MIN.	8 UP OR DOWN STREAM	9 REMARKS
2	Boat	9:45A	9:55A	10					D	
8	Hobbie Cat	11:40A	11:50A	10					UP	
9	Sharky	10:45A	11:00A	10					UP	
12	Baco	9:20A	9:30	10					UP	
13	Baby J	3:40	3:50	10					D	MP
14	Capt Maffitt	10:30A	10:40A	10					UP	
14	Capt Maffitt	2:00p	2:10p	10					D	MP
16	High Cotton	11:20	11:30	10					UP	TUG
24	Pleasure Boat	3:10	3:15	5					UP	BJ
26	PARKER	10:00A	10:10A	10					UP	
28	Never My Love	8:25A	8:35A	10					UP	
28	Capt Maffitt	10:30A	10:30A	10					UP	
28	Capt Maffitt	1:57	2:06	10					D	MP
29	Pleasure Boat	2:05	3:15	10					UP	BJ
29	Jacobs Run	4:50	5:00	10					D	BJ
2	OTHER MARKER	12:40P	12:50P						UP	
2	Open - Close	2:30p	3:29p							MP MP
3	Open - Close	3:40p	6:15p							MP MP
3	OPEN - CLOSE	6:00A	10:30A							
3	OPEN - CLOSE	10:40A	1:55P							
3	Open - Close	2:15	3:15							MP
3	Open - Close	3:30	6:30							MP
4	OPEN - CLOSE	7:45A	9:30A							
4	OPEN - CLOSE	3:15P	3:[illegible]P							
6	OPEN - CLOSE	3:45P	7:30P							
10	OPEN - CLOSE	10:50A	1:30P							
12	Open - Close	10:30	10:40							MP
12	Open - Close	10:45A	11:45p							MP MP
13	Open - Close	9:15A	5:30p							MP MP
14	Open - Close	10:20	10:30							MP

SEE OTHER SIDE

White: Engineer of Bridges
Canary: Division Engineer
Pink: Drawtender's Log

USA TRANSPORTATION

REPORT OF OPENINGS MADE FOR PASSAGE OF BOATS

DIVISION Florence BRIDGE Navo-55a

MILEPOST SE 360.8 MONTH Sept 2019 SHEET ___ OF ___

1 DAY OF MONTH	2 NAMES OF BOATS	3 TIME DRAW OPENED	4 TIME DRAW CLOSED	5 LENGTH OF TIME OPEN IN MINUTES	6 DELAY TO BOATS NO.	6 DELAY TO BOATS MIN.	7 DELAY TO TRAINS NO.	7 DELAY TO TRAINS MIN.	8 UP OR DOWN STREAM	9 REMARKS
14	Open Close	1:57p	2:00	10						MP
16	Sequel	10:40A	10:50A	10					D	
16	Jolly Boat	11:15A	11:25A	10					D	
16	SMOKE SHOW	12:10P	12:20P	10					D	
16	MARY KAY	11:20A	11:30A	10					D	
19	Wild Rover III	9:00A	9:10A	10					D	
19	Never my Love	1:50p	2:15p	25					D	
20	ESCAPE	9:00A	10:00A	10					D	
20	CAPT MALLETT	9:25A	9:35A	10					D	
26	Stingray	11:30	12:00	30					Up	MP
28	Capt Moffitt	10:20	10:35	15					UP	MP
28	Cape Fear River Boat	10:20	10:35	15					UP	MP
28	Capt Moffitt	1:45	1:50	5					D	MP
2	OPEN - CLOSE	10:30A	10:40A	10					UP	
4	OPEN - CLOSE	9:10A	9:20A	10					UP	
5	OPEN - CLOSE	4:40P	4:50P	10					UP	
6	OPEN - CLOSE	1:05P	1:15P	10					D	
8	OPEN - CLOSE	12:40P	12:50P	10					D	
9	OPEN - CLOSE	9:30A	9:40A	10					D	
9	OPEN - CLOSE	10:00A	10:10A	10					D	
9	OPEN - CLOSE	10:30A	10:40A	10					D	
9	OPEN - CLOSE	2:00P	2:10P	10					D	
10	OPEN - CLOSE	10:35A	10:35A	10					D	
10	OPEN - CLOSE	11:05A	11:15A	10					D	
11	Open - Close	12:30p	12:40p	10					D	MP
11	Open - close	2:15p	5:15p						D	MP
12	Open - close	2:00p	4:45p						D	MP
12									D	MP
14	small yacht	10:45	11:00	15					UP	SMP
14	BARGE	2:10P	4:10	50					UP	SMP

SEE OTHER SIDE

White: Engineer of Bridges
Canary: Division Engineer
Pink: Drawtender's Log

USA TRANSPORTATION

REPORT OF OPENINGS MADE FOR PASSAGE OF BOATS

DIVISION Florence BRIDGE Navassa

MILEPOST SE 360.8 MONTH July 2019 SHEET ___ OF ___

1 DAY OF MONTH	2 NAMES OF BOATS	3 TIME DRAW OPENED	4 TIME DRAW CLOSED	5 LENGTH OF TIME OPEN IN MINUTES	6 DELAY TO BOATS NO.	6 DELAY TO BOATS MIN.	7 DELAY TO TRAINS NO.	7 DELAY TO TRAINS MIN.	8 UP OR DOWN STREAM	9 REMARKS
2	BOAT	11:40A	11:50A	10					UP	
3	CAPT MAFFITT	10:30A	10:40A	10					UP	
3	CAPT MAFFITT	2:00P	2:10P	10					D	
4	Sting Ray	10:30AM	10:50	20					D	MJ
9	Scatter Cat	3:22Pm	3:32	10					UP	JP
10	KAREN	2:00	2:10	10					UP	PJ
12	Cachet	10:44	10:45						D	JA
17	Capt: MaFFitt	1030 AM	11:20						UP	JA
17	Karen	1:56pm	1:57						D	JA
17	MaFFitt	2:00	2:03						D	JA
22	JAIL	10:50A	11:00A	10					UP	
22	BOAT	4:00P	4:10P	10					D	
23	MARTECH	9:30A	9:40P	10					UP	
23	MARTECH	11:30A	11:40A	10					D	
24	Baby Jane	8:20A	8:30A	10					UP	
24	MARTECH	9:25A	9:35A	10					UP	
24	MARTECH	11:50A	12:00P	10					D	
25	MARTECH	9:30A	9:40A	10					UP	
25	MARTECH	11:25A	11:35A	10					D	
26	QUEEN B	2:30P	2:40P	10					D	
31	CAPT MAFFITT	10:47A	10:57A	10					UP	
31	CAPT MAFFITT	2:15P	8:25P	10					D	

SEE OTHER SIDE

White: Engineer of Bridges
Canary: Division Engineer
Pink: Drawtender's Log

CSX TRANSPORTATION

REPORT OF OPENINGS MADE FOR PASSAGE OF BOATS

DIVISION Florence BRIDGE Navassa

MILEPOST SE 360.8 MONTH June 2019 SHEET ___ OF ___

1 DAY OF MONTH	2 NAMES OF BOATS	3 TIME DRAW OPENED	4 TIME DRAW CLOSED	5 LENGTH OF TIME OPEN IN MINUTES	6 DELAY TO BOATS NO.	6 DELAY TO BOATS MIN.	7 DELAY TO TRAINS NO.	7 DELAY TO TRAINS MIN.	8 UP OR DOWN STREAM	9 REMARKS
1	TORTUGA	9:10A	11:45						D	MP
1	Pleasure Boat	1800	1830	30					D	TCS
5	CAPT MAFFITT	10:35A	10:39A	10					UP	
5	CAPT MAFFITT	2:00P	2:10	10					D	DLY
6	QUEEN JEAN	8:30A	8:40A	10					D	
6	LOUISA	10:35P	12:35P	5					UP	
7	FAIR DUNKIN	11:00AM	11:15	15					UP	
10	KNOT BUSY	10:30A	10:40A	10					D	
A	CAPT MAFFITT	10:30A	10:45A	10					UP	
15	11	13:50	14:06	16					D	
25	SANDERSON	10:30A	10:40A	10					UP	
25	SANDERSON	1:00P	1:10P	10					D	
27	SAIL-FAIRDUNKIN	9:30A	9:30A	10					D	
27	BOAT	13:30P	13:40P	10					UP	
27	SEATOW 10	2:55P	3:05P	10					UP	
27	SEATOW 10	3:20P	3:20P	5					D	
30	BOAT	1:30P	1:35P	5					UP	

SEE OTHER SIDE

White: Engineer of Bridges
Canary: Division Engineer
Pink: Drawtender's Log

CSX TRANSPORTATION

REPORT OF OPENINGS MADE FOR PASSAGE OF BOATS

DIVISION Florence BRIDGE Navassa

MILEPOST SE 360.8 MONTH May 2019 SHEET ___ OF ___

1 DAY OF MONTH	2 NAMES OF BOATS	3 TIME DRAW OPENED	4 TIME DRAW CLOSED	5 LENGTH OF TIME OPEN IN MINUTES	6 DELAY TO BOATS NO.	6 DELAY TO BOATS MIN.	7 DELAY TO TRAINS NO.	7 DELAY TO TRAINS MIN.	8 UP OR DOWN STREAM	9 REMARKS
8	CAPT MAFFITT	10:30A	10:40A	10					UP	
8	CAPT MAFFITT	2:05P	2:15P	10					D	MP
9	UNCW Sturgeon	1:50P	2:00P	10					D	DJ
10	HATTERAS	1:55P	2:05P	10					UP	MP
11	SKI BOAT	5:10	5:20	10					UP	MP
14	SM BOAT	9:25A	9:30A	5					U	
14	CAPE FEAR (UNCW)	11:35A	11:40A	10					UP	
15	JoHall Knox	10:30A							UP	
15	TWO CAN		10:45A	10					D	
15	Private Boat	2:20P	2:25P	5					UP	MP
15	Private Boat	6:10P	6:15P	5					D	MP
17	HEARTTHA	3:40P	3:50P	10					D	
18	Pleasure Boats	4:00P	7:45P	345					D	
20	MAYDA - SAIL	10:15A	10:25A	10					D	
21	WHISTLING DIXIE	9:00A	9:10A	10					D	
21	LIBERTY - SAIL	11:35A	11:45A	10					UP	
22	CAPT MAFFITT	10:30A	10:40A	10					UP	
22	CAPT MAFFITT	2:00P	3:30	1:30					D	MP
23	LADY JANE	1:20P							UP	
23	WRECKING CREW		1:30P	10					UP	
23	WRECKING CREW	3:10P	3:15P	5					D	
24	CAROLINA WISDOM	9:25A	9:30	5					D	
25	NC Wildlife	2:55P	3:00P	5					D	
25	NC WILDLIFE	6:00P	6:10	10					D	
28	Sail	11:40A	11:50A	10					D	
28	BOAT	4:20P	4:30P	10					D	
29	CAPE FEAR (UNCW)	12:40P	12:50P	10					D	
09	HAT TRICK	4:50P	5:00P	10					UP	
31	TORTUGA	10:10A	10:20A	10					D	
31	TORTUGA	12:25P	12:35P	10					UP	

SEE OTHER SIDE

White: Engineer of Bridges
Canary: Division Engineer
Pink: Drawtender's Log

CSX TRANSPORTATION

REPORT OF OPENINGS MADE FOR PASSAGE OF BOATS

DIVISION Florence BRIDGE Navassa

MILEPOST SE 360.8 MONTH April 2019 SHEET ___ OF ___

1 DAY OF MONTH	2 NAMES OF BOATS	3 TIME DRAW OPENED	4 TIME DRAW CLOSED	5 LENGTH OF TIME OPEN IN MINUTES	6 DELAY TO BOATS NO.	6 DELAY TO BOATS MIN.	7 DELAY TO TRAINS NO.	7 DELAY TO TRAINS MIN.	8 UP OR DOWN STREAM	9 REMARKS
3	GREAT ESCAPE	9:15A							UP	
9	COSMO		11:00A	105					UP	
9	CAROLINA WOODEN	9:15A	9:25A	10					UP	
11	STRIKE	10:05A	10:15A	10					D	
15	WILMINGTON	10:05A	11:00A	10					UP	
15	WILMINGTON	1:30P	1:40P	10					D	
16	SM BOAT	9:10A	9:20A	10					UP	
17	GET GRILLED	9:25A	9:35A	10					D	
17	CORDOVA	2:45P	3:00P						UP	MP
23	RV MARTECH	10:10A	10:20A	10					UP	
23	RV MARTECH	1:20P	1:30P	10					D	
24	CAPT MOFFITT	11:25A	11:35A	5					UP	
24	Capt Moffit	2:15P	2:20P	5					D	MP
26	Miss Carlot	10:00A	10:15A	15					U	MP
26	Blood Money	12:00	12:15	15					D	MP
29	Lizzy Faye	4:20P	4:30P	10					UP	MP
		10:35A								

SEE OTHER SIDE

White: Engineer of Bridges
Canary: Division Engineer
Pink: Drawtender's Log

CSX TRANSPORTATION

REPORT OF OPENINGS MADE FOR PASSAGE OF BOATS

DIVISION Florence BRIDGE Navassa

MILEPOST SE 360.8 MONTH March 2019 SHEET ___ OF ___

1 DAY OF MONTH	2 NAMES OF BOATS	3 TIME DRAW OPENED	4 TIME DRAW CLOSED	5 LENGTH OF TIME OPEN IN MINUTES	6 DELAY TO BOATS NO.	6 DELAY TO BOATS MIN.	7 DELAY TO TRAINS NO.	7 DELAY TO TRAINS MIN.	8 UP OR DOWN STREAM	9 REMARKS
1	Blue Boat	11:05A	11:15A	10					D	
6	Plan B	9:40A	9:40A	0					UP	
6	ATLANTIS	11:00	11:10A	10					UP	
6	Tow Boat US	2:15p	3:15p	1 hr					up	MP MP
6	Tow Boat US		3:19p						D	MP
7	SOUTHERN BELLE	1:15P	1:25P	10					UP	
12	Get Grilled	3:00p	4:00p						up	MP
18	ATLANTIS	11:10A	11:20A	10					D	
18	WHITE BOAT	12:30P	12:40P	10					D	
13	Atlantis	4:00p	4:15p	15					D	MP
21	STARSHIP	11:00A	11:15A	15					D	
28	Fishing Boat (All In)	4:00p	4:15	10					D	DJ DJ
28	All In	4:30p	4:45	10					D	DJ DJ
29	Tow Boat	4:45	5:45	1 hr						MP
30	CFM	11:00A	12:00	1 hr					up	MP
30	CFM	3:25p	3:23p	10m					D	DJ

SEE OTHER SIDE

Whites: Engineer of Bridges
Canary: Division Engineer
Pink: Drawtender's Log

CSX TRANSPORTATION

REPORT OF OPENINGS MADE FOR PASSAGE OF BOATS

DIVISION Florence BRIDGE Navo-55a

MILEPOST SE 360.8 MONTH February 2019 SHEET ___ OF ___

1 DAY OF MONTH	2 NAMES OF BOATS	3 TIME DRAW OPENED	4 TIME DRAW CLOSED	5 LENGTH OF TIME OPEN IN MINUTES	6 DELAY TO BOATS NO.	6 DELAY TO BOATS MIN.	7 DELAY TO TRAINS NO.	7 DELAY TO TRAINS MIN.	8 UP OR DOWN STREAM	9 REMARKS
6	BOAT	11:30A	11:40A	10					DR	
8	BOAT	9:05A	9:35A	10					D	
19	BOAT	10:40A	10:50A	10					DR	
19	BOAT	12:50P	1:00P	10					D	
21	ONE MORE TIME	10:00A	10:05A	5					D	
21	Chasin Tails	2:05P	2:15P	10					UP	DT
21	WAFF Contractor	2:45P	3:00P	15					D	DT
21	Chasin Tails	4:10pm	4:20pm	10						DT
25	Blue Boat	1:10P	1:20P	10					D	DT
26	TUMBLEWEED	11:35A	11:45A	10					D	DT

SEE OTHER SIDE

White: Engineer of Bridges
Canary: Division Engineer
Pink: Draftender's Log

CSX TRANSPORTATION

REPORT OF OPENINGS MADE FOR PASSAGE OF BOATS

DIVISION Florence BRIDGE Navassa

MILEPOST SE 360.8 MONTH JAN 2019 SHEET ___ OF ___

1 DAY OF MONTH	2 NAMES OF BOATS	3 TIME DRAW OPENED	4 TIME DRAW CLOSED	5 LENGTH OF TIME OPEN IN MINUTES	6 DELAY TO BOATS NO.	6 DELAY TO BOATS MIN.	7 DELAY TO TRAINS NO.	7 DELAY TO TRAINS MIN.	8 UP OR DOWN RIVER	9 REMARKS
3	JR	10:00A	10:10A	10					D	
7	SUNNY POINT	10:50A	10:58A	10					D	
7	CAPT MATT JT	1:30P	1:35P	5					D	
7	ATLANTIC STAR	2:10P	2:20P	10					D	
8	BOAT	10:50A	10:55A	5					D	
8	STARSHIP	12:35P	12:45P	10					D	
8	PRIVATE	3:05P	3:10P	5					D	MP
14	ARMY - Sunny Point	3:30P	3:40P	10					D	MP
15	SANDERSON	8:40A	8:50A	10					D	
16	BOAT	12:05P	12:15P	10					D	
17	SANDERSON	9:50A	10:00	5					D	
19	PRIVATE BOAT	12:20	1:34P						UA	MP MP
28	CAPT MATT JT	2:30P	2:40P	10					D	

White: Engineer of Bridges
Canary: Division Engineer
Pink: Drawtender's Log

SEE OTHER SIDE

USA TRANSPORTATION

REPORT OF OPENINGS MADE FOR PASSAGE OF BOATS

DIVISION Florence BRIDGE Navassa

MILEPOST SE 360.8 MONTH DEC 2018 SHEET ___ OF ___

1 DAY OF MONTH	2 NAMES OF BOATS	3 TIME DRAW OPENED	4 TIME DRAW CLOSED	5 LENGTH OF TIME OPEN IN MINUTES	6 DELAY TO BOATS NO.	6 DELAY TO BOATS MIN.	7 DELAY TO TRAINS NO.	7 DELAY TO TRAINS MIN.	8 UP OR DOWN STREAM	9 REMARKS
1	Small Fishy Boat	3:00pm	3:15	15					D	JT
3	STRIKE	12:45P	12:55P	10					JT	
8	4 fishing boats	9:00a	3:30p						4P	
11	THERAPY	10:00A	10:10A	10					JT	
11	NEXT ADVENTURE	10:15A	10:25A	10					JT	
11	NEXT ADVENTURE	12:25P	12:35P	10					D	
11	Wildlife Boat	3:30p	4:45p	1:15						m
12	TREASA LYNN	9:50A							D	
12	JABBA RUN		10:00A	10					JT	
12	RV STURGEON	10:50A	11:00A	10					JT	
12	RV STURGEON	12:35P	12:45P	10					D	
27	BOAT	10:25A	10:35A	10					JT	
29	BOAT	10:30A	10:40A	10					D	

SEE OTHER SIDE

White: Engineer of Bridges
Canary: Division Engineer
Pink: Drawtender's Log

CSX TRANSPORTATION

REPORT OF OPENINGS MADE FOR PASSAGE OF BOATS

DIVISION Florence BRIDGE Navassa

MILEPOST SE 360.8 MONTH Nov 2018 SHEET ___ OF ___

1	2	3	4	5	6		7		8	9
DAY OF MONTH	NAMES OF BOATS	TIME DRAW OPENED	TIME DRAW CLOSED	LENGTH OF TIME OPEN IN MINUTES	DELAY TO BOATS NO.	DELAY TO BOATS MIN.	DELAY TO TRAINS NO.	DELAY TO TRAINS MIN.	UP OR DOWN STREAM	REMARKS
1	Sail	1:16P	1:26P	10					D	
7	Blue Blazer	2:55p	3:05p	10					D	MAP
8	Blood Money	8:10A	8:20A	10					UP	
8	Stella	9:15A	9:20A	5					UP	
8	RV Sturgeon	9:57A	10:02	5					UP	
8	RV Sturgeon	12:40P	12:45P	5					D	
16	Cypress	10:[illegible]	11:[illegible]	10					UP	
19	Motor Boat	10:35A	10:40A	5					D	
19	Boat	12:18P	12:28P	7					D	
26	Boat	11:33A	11:38A	5					UP	
26	Boat	1:30	1:35P	5					D	
26	Sport Fisher	3:40p	3:50p	10					D	MAP
30	Stella	9:35A	9:40A	5					D	
30	Theiray	10:[illegible]	10:[illegible]	10					D	
30	Cypress	1:05P	1:15P	10					D	

White: Engineer of Bridges
Canary: Division Engineer
Pink: Drawtender's Log

SEE OTHER SIDE

CSX TRANSPORTATION

REPORT OF OPENINGS MADE FOR PASSAGE OF BOATS

DIVISION Florence BRIDGE Navassa

MILEPOST SE 360.8 MONTH October 2018 SHEET ___ OF ___

1 DAY OF MONTH	2 NAMES OF BOATS	3 TIME DRAW OPENED	4 TIME DRAW CLOSED	5 LENGTH OF TIME OPEN IN MINUTES	6 DELAY TO BOATS NO.	6 DELAY TO BOATS MIN.	7 DELAY TO TRAINS NO.	7 DELAY TO TRAINS MIN.	8 UP OR DOWN STREAM	9 REMARKS
		Open	Closed							
3	Tow Boat US	8:01P	8:15						UP	MOP
3	Tow Boat US	9:10P	9:23P						D	MOP
5	BELLA MARS	9:15A	9:25A	10					D	
5	MARY K	10:30A							D	
5	LADY SUNSHINE		10:40A	10					D	
7	BOAT	11:45A	11:55A	10					D	
8	CRANE	9:00A	9:20A	20					D	
8	BOAT	11:00A	11:05A	5					D	
9	NO WORRIES	10:55A	11:05A	10					UP	
9	FAKE NEWS	1:00P	1:10P	10					D	
10	SAIL	10:20A	10:30A	10					UP	
12	SPLASH DOWN	11:25A	11:35A	10					D	
12	ESCAPE	10:50P	11:05P	10					D	
12	SLOW DANCE II	1:40P	1:50P	10					D	
16	BY DESIGN	10:05A	10:15A	10					D	
16	ADVENTURE	12:10P	12:20P	10					UP	
18	LUCY	3:25P	3:35P	10					D	MOP
22	Work Barge	4:00P	4:30	30					UP	MOP
23	VONDA KAY	10:45A	10:55A	10					D	
24	BOAT	10:25A							D	
24	CAPT MALLETT		10:35A	10					UP	
24	BOAT	10:40A							UP	
24	DEA TOW								UP	
24	BOAT		1:40P	120					D	
24	CAPT MALLETT	1:50P	2:00P	10					D	
26	BOAT	4:10P	4:20P	10					D	
28	BOAT	1:45P	1:55P	10					UP	
28	Boat Private	2:55P	3:05P	10					D	MOP
29	SAIL	1:00P	1:20P	20					D	
29	Plan B	15:30	15:35	5					D	MOP

SEE OTHER SIDE

White: Engineer of Bridges
Canary: Division Engineer
Pink: Drawtender's Log

CSX TRANSPORTATION

REPORT OF OPENINGS MADE FOR PASSAGE OF BOATS

DIVISION Florence BRIDGE Nav-55a

MILEPOST SE 360.8 MONTH September 2018 SHEET ___ OF ___

1 DAY OF MONTH	2 NAMES OF BOATS	3 TIME DRAW OPENED	4 TIME DRAW CLOSED	5 LENGTH OF TIME OPEN IN MINUTES	6 DELAY TO BOATS NO.	6 DELAY TO BOATS MIN.	7 DELAY TO TRAINS NO.	7 DELAY TO TRAINS MIN.	8 UP OR DOWN STREAM	9 REMARKS
5	CAPT Moffit	10:25	10:30	5					UP	MGP
5	CAP Moffit	1:50p	2:00p	10					D	MGP
7	SEA Horse	10:45A	10:50	10					UP	MGP
7	Gidgit	5:25p	5:35	10					UP	MGP
9	Private	1:05							UP	MGP
10	open for Boats	8:00A							/	MGP
10	close for Train	11:00A							/	MGP
10	open for Boats	11:45A							/	MGP
11	open for Boats	9:00A							/	MGP
11	Closed for Train	10:40A							/	MGP
11	open for Boats	11:40A							/	MGP
11	closed	5:00							/	MGP
17	OPEN FOR BOAT	2:00p							/	DLJ
19	Closed		6:15p						/	DLJ
20	open FOR Boats	2:30p							/	DLJ
	Closed		6:00						/	DLJ
20	Desperado	10:43	10:46						UP	LJ
21	OPEN FOR Boat Traffic	11:15A	—							DLJ
21	Closed		11:45A							DLJ

SEE OTHER SIDE

White: Engineer of Bridges
Canary: Division Engineer
Pink: Drawtender's Log

USX TRANSPORTATION

REPORT OF OPENINGS MADE FOR PASSAGE OF BOATS

DIVISION Florence BRIDGE Navassa

MILEPOST SE 360.8 MONTH AUG 2018 SHEET ___ OF ___

1 DAY OF MONTH	2 NAME OF BOATS	3 TIME DRAW OPENED	4 TIME DRAW CLOSED	5 LENGTH OF TIME OPEN IN MINUTES	6 DELAY TO BOATS NO.	6 DELAY TO BOATS MIN.	7 DELAY TO TRAINS NO.	7 DELAY TO TRAINS MIN.	8 UP OR DOWN STREAM	9 REMARKS
1	Strike	220								
6	Gail	3:55P	4:05	10					UP	
9	Wind Catcher	6:40A	6:50A	10					UP	
13	Sea Witch	11:40A	11:50A	10					UP	
14	Boat	9:05A	10:06A	10					UP	
14	Natalie	1:45P	1:55P	10					D	
15	Boat	2:00P	2:05P	5					D	
18	*2 Boats	4:55P	4:50P	5					UP	
20	Fire Boat	7:30A	7:40A	10					UP	
22	Survey	10:40A	10:45A	5					UP	
22	Survey	2:10P	2:15P	5					D	
24	Seawitch	10:50A	11:00A	10					D	
24	Fire Boat	12:35P	12:45P	10					D	
31	Tug	9:50							UP	mp

SEE OTHER SIDE

White: Engineer of Bridges
Canary: Division Engineer
Pink: Drawtender's Log

CSX TRANSPORTATION

REPORT OF OPENINGS MADE FOR PASSAGE OF BOATS

DIVISION Florence BRIDGE Navassa

MILEPOST SE 360.8 MONTH July 2018 SHEET 1 OF

1 DAY OF MONTH	2 NAMES OF BOATS	3 TIME DRAW OPENED	4 TIME DRAW CLOSED	5 LENGTH OF TIME OPEN IN MINUTES	6 DELAY TO BOATS NO.	6 DELAY TO BOATS MIN.	7 DELAY TO TRAINS NO.	7 DELAY TO TRAINS MIN.	8 UP OR DOWN STREAM	9 REMARKS
3	Knot Busy	12:15P	12:25P	10					UP	
5	Speedy C	2:30							UP	
9	ALL IN	7:13P	7:23P	10					UP	JTH
9	TALKING THRASH	8:00P	8:08P	8					UP	JTH
10	Sail Boat	2:33	2:40	7					UP	LC
11	ADVENTUAS	9:00A	9:05A	5					UP	
11	CAPT MAFFITT	10:30A	10:35A	5					UP	
11	CAPT MAFFITT	1:50P	2:00P	10					D	
12	Knot Busy	10:00A	10:10A	10					D	
13	RV STURGEON	10:09A	10:14A	5					UP	JTH
13	Miss Nicole	11:12A							UP	JTH
13	Miss Nicole								D	JTH
13	Glocit		12:12P	60					D	JTH
15	2 Fishing Boats	1:20A	1:30A	10					D	DJ
17	BOAT	10:50A	11:00A	10					UP	
24	BOAT	7:20A	7:35A	5					D	
24	BOAT	9:30A	9:35A	5					UP	
25	RV STURGEON	11:10A	11:15A	5					UP	
27	All in	2:20	2:27	7					D	
30	Tow Boat US	9:30A							UP	
30	Boat in Tow								UP	
30	Sail		9:45A	15					D	
30	Tow Boat US	10:00A	10:10A	10					D	
30	Sail	10:50A	11:00A	10					UP	
30	S. Boat	11:40							UP	
30	S. Boat								D	
30	S. Boat		1:50	10					D	
31	Cobbs Craft	12:30P	12:40	10					D	

SEE OTHER SIDE

White: Engineer of Bridges
Canary: Division Engineer
Pink: Drawtender's Log

USACE TRANSPORTATION

REPORT OF OPENINGS MADE FOR PASSAGE OF BOATS

DIVISION Florence BRIDGE Navassa

MILEPOST SE 360.8 MONTH JUNE 2018 SHEET 1 OF

1 DAY OF MONTH	2 NAMES OF BOATS	3 TIME DRAW OPENED	4 TIME DRAW CLOSED	5 LENGTH OF TIME OPEN IN MINUTES	6 DELAY TO BOATS NO.	6 DELAY TO BOATS MIN.	7 DELAY TO TRAINS NO.	7 DELAY TO TRAINS MIN.	8 UP OR DOWN STREAM	9 REMARKS
04	Ceili	2:15P	2:23	8					UP	JTH
6	Capt Maffitt	10:30A	10:40A	10					UP	
6	Capt maffitt	2:1[illegible]								
7	Summer Wind	7:30A	7:40A	10					D	
09	Jack Frost	10:50A	10:58A	8					D	JTH
09	Jack Frost	1:11P	1:19P	8					UP	JTH
14	Total Package	11:30A	11:40A	10					UP	
19	Atlantis	12:35P	12:45P	10					UP	
19	Bella Rae	1:40P	1:50P	10					D	
20	Capt Maffitt	10:25A	10:35A	10					UP	
24	Decision II	5:40P	5:48P	8					UP	JTH
27	RV Sturgeon	10:25A	10:35A	10					UP	
28	Survey	8:15A	8:25A	10					UP	
28	Ceili	12:35P	12:45P	10					D	
28	34 Regulator	6:12	6:22	10					D	DCJ
28	Survey Boat	6:50	7:00	10					D	DCJ
29	Sail	11:40							D	
29	Atlantis		12:00	20					D	
29	3 Boats	4:20P	4:30P	5					D	
3	Pontoon Boat	3:20p	3:40	10					Up	DCJ

SEE OTHER SIDE

White: Engineer of Bridges
Canary: Division Engineer
Pink: Drawtender's Log

CSX TRANSPORTATION

REPORT OF OPENINGS MADE FOR PASSAGE OF BOATS

DIVISION Florence BRIDGE Navassa

MILEPOST SE 360.8 MONTH MAY 2018 SHEET ___ OF ___

1 DAY OF MONTH	2 NAME OF BOATS	3 TIME DRAW OPENED	4 TIME DRAW CLOSED	5 LENGTH OF TIME OPEN IN MINUTES	6 DELAY TO BOATS NO.	6 DELAY TO BOATS MIN.	7 DELAY TO TRAINS NO.	7 DELAY TO TRAINS MIN.	8 UP OR DOWN STREAM	9 REMARKS
1	BODHA Vool	12:05P	12:15P	10					D	
2	ISLAND PIZZE	12:15P	12:25P	10					UP	
2	BOAT	12:30P	12:40P	10					D	
4	GIGET	1:10P	1:20P	10					UP	
9	CAPT MATT ITT	10:30A	10:40A	10					UP	
9	CAPT MATT ITT	2:00P	2:10P	10					D	
11	BLUE	9:20P	9:30P	10					D	
14	THAT'll DO	10:20A	10:30A	10					D	
21	SPICE ISLAND	1:35P	1:45P	15					UP	
23	CAPT MATT ITT	10:35A	10:45A	10					UP	
23	TWO CAN	1:35P							UP	
23	CAPT MATT ITT		2:10P	35					D	
24	GRACE	12:20P	12:30P	10					D	
30	AIRBOAT	10:10A	10:15A	5					D	
30	AIRBOAT	11:00A	11:05A	5					D	

White: Engineer of Bridges
Canary: Division Engineer
Pink: Drawtender's Log

SEE OTHER SIDE

NAVIGATION IMPACT REPORT

for the Rail Realignment Project

Wilmington Harbor

Completed by the City of Wilmington
Aubrey Parsley, PE
Director of Rail Realignment
305 Chestnut Street, PO Box 1810
Wilmington, NC 28402

September 24, 2021

A. Means of data collection:

The primary sources of data were Automatic Identification System (AIS) datasets from 2019 which were analyzed and refined for the purposes of this report by the City of Wilmington and the tools made available by MarineCadastre.gov (a collaboration between the Bureau of Ocean Management (BOEM) and the National Oceanic and Atmospheric Administration (NOAA)) and bridge lift data from the North Carolina Department of Transportation (NCDOT). Additional information was gathered via direct outreach with known stakeholders, users of the relevant waterway as well as from other publically available sources.

- AIS Data for 2019 (see Exhibit D) (https://coast.noaa.gov/htdata/CMSP/AISDataHandler/2019/index.html)
- USGC's National Vessel Documentation Database Queries via NOAA website
- Bridge lift logs from NCDOT (see Exhibit D)
- The City of Wilmington held an open comment period between June 28th and July 26th, 2021 in which a draft of this Navigation Impact Report was posted online and made available for public review and comment. The City publicized this opportunity to view and comment on the report via a press release, newspaper advertisement, social media posts, flyers, mailers, local government meetings, direct telephone calls, direct email communications, various presentations to community groups and on television (see Exhibit H)
- Direct outreach to various government, private and public stakeholders (see Exhibit H)
- Other resources as made available online, specific citations have been incorporated throughout this report
- On-site visits

B. Present governing bridge(s) or aerial structure(s) on the waterway:

1. *Identify all bridges upstream and downstream of the proposed bridge site and their existing horizontal and vertical clearances to determine the existing minimum*

horizontal and vertical clearances (including overhead transmission line clearances). Provide in table format.

(If all bridges downstream have the same minimum clearance, state instead of the above requested information).

Table 1 below depicts three upstream bridges of the proposed railroad bridge site. There are no bridges downstream of the proposed bridge site. There is, however, an overhead transmission line downstream of the proposed bridge site which appears in Table 1.

Also note that the proposed railroad bridge site related to this NIR is located immediately south of the Cape Fear Memorial Bridge. The bridge site proposed seeks to be compatible with the planned replacement of the Cape Fear Memorial Bridge (US 74/76) by NCDOT (see Section M for additional information). See Exhibit A for conceptual engineering drawings of the Rail Realignment Project depicting the proposed site for the new railroad bridge. Also see Exhibit B for NCDOT's Express Design Summary for the replacement of the Cape Fear Memorial Bridge, specifically Option 4 which contemplates the replacement of the highway bridge alongside the proposed railroad bridge.

TABLE 1:

Facility Carried	Feature Intersected	Waterway Milepoint	Channel Depth (MHW)	Vertical Clearance (MHW)	Horizontal Clearance
CSXT Hilton Bascule Bridge	Wilmington Harbor, NE Cape Fear River	1.0	25'	4' closed; Unlimited open	200'
Isabel Holmes Bridge NC 133	Wilmington Harbor, NE Cape Fear River	1.5	32'	40' closed; Unlimited open	200'
Cape Fear Memorial Bridge US 74 / 76	Wilmington Harbor, Cape Fear River	26.8	32'	65' closed; 135' open	350'
Overhead Transmission Line	Lower Brunswick Range, Cape Fear River	21.2	42'	216'	Full Channel

2. *Does the proposed bridge match (or is greater than) the navigational clearance of the existing structures on the waterway?*

Horizontal navigational clearances for the proposed bridge would be less than the existing Cape Fear Memorial Bridge upstream but would be greater than both the Isabel Holmes Bridge and CSXT Hilton Bridge further upstream.

All of the existing structures over the waterway are moveable span bridges, thus vertical clearance comparisons must be made for the bridge in the open, close and resting positions (noting that for all existing structures over the waterway the closed

and resting positions are the same). Comparing open position vertical navigational clearances, the proposed bridge would match the most restrictive clearances on the waterway today (the Cape Fear Memorial Bridge). Comparing closed position vertical navigational clearances, the proposed bridge would provide for greater clearances than the CSXT Hilton Bridge but less clearance than the Isabel Holmes Bridge and Cape Fear Memorial Bridge. The design of the proposed bridge is expected to accommodate a third position (resting position) which will provide for different clearances than the open or closed positions. The resting position of the proposed bridge will match the most restrictive resting position vertical navigational clearance over the waterway today (the Isabel Holmes Bridge).

As is represented in the data and statistics herein, all vessels of significant size use the waterway for the singular purpose of serving a single industry upstream of the CSXT Hilton Bascule Bridge. Thus, all of the largest vessels using the waterway transit all three bridges identified in Table 1 – the Cape Fear Memorial Bridge, the Isabel Holmes Bridge and CSXT Hilton Bascule Bridge. The most limiting clearances across these three bridges are 200 feet horizontal and 135 feet vertical.

For the purposes of this Navigational Impact Report, the City of Wilmington proposes the following clearances be considered toward reasonably meeting the navigational needs of the waterway:

Horizontal Clearance:	250 feet
Vertical Clearance:	<u>Open Position</u> 135 feet, matching the existing Cape Fear Memorial Bridge upstream.
	<u>Closed Position</u> 20 feet, which is more restrictive than the 65 feet closed position of the Cape Fear Memorial Bridge and the 40 feet closed position of the Isabel Holmes Bridge but less restrictive than the CSXT Hilton Bascule Bridge.
	<u>Resting Position</u> 40 feet, which is more restrictive than the 65 feet of the Cape Fear Memorial Bridge and unlimited clearance provided by the CSXT Hilton Bascule Bridge, but equals the clearance provided by the Isabel Holmes Bridge.

Train frequencies over the proposed bridge are expected to average between 2 and 4 trains per day, with current volume projections possibly necessitating approximately 6 trains per day by 2040. Using the dataset presented in Exhibit D, the frequency of vessels transiting the waterway are estimated as follows:

- An estimated total of 625 vessel transits per year or approximately 2 vessels per day transiting the proposed bridge location
    - AIS shows 525 vessel transits of the proposed bridge location
    - NCDOT lift logs for Cape Fear Memorial Bridge show 37 lifts resulting from vessel (sailboat) transits not present in the AIS data

    - NCDOT lift logs for Isabel Holmes Bridge show an additional 63 lifts resulting from vessel (sailboat) transits not in the AIS data or the Cape Fear Memorial Bridge lift log, but which can be reasonably assumed to traverse the proposed bridge location
- Of the estimated 625 yearly vessel transits, it can be reasonably implied from the dataset presented in Exhibit D that at least 400 of the transits would require the proposed bridge to lift if it were to rest in the closed position (this estimate includes vessels which required lifts from the existing Cape Fear Memorial Bridges or Isabel Holmes Bridges as well as vessel transits for sailboats which did not require lifts but transited the waterway)

3. *What is the most restrictive horizontal clearance on the waterway? (This may be a fixed bridge downstream/upstream of the proposed structure, a low hanging power line downstream/upstream of the bridge(s), or it may be some other structure that limits horizontal clearance. Sometimes the existing to-be-replaced bridge(s) is the most restrictive structure.*

   Upstream of the proposed bridge location the structure which creates the most restrictive horizontal clearance is the Isabel Holmes Bridge and the CSXT Hilton Bascule Bridge.

   a. Milepoints: 1.0 and 1.5 of the Northeast (Cape Fear) River

   b. Horizontal clearance: 200 feet

   There are no bridges, structures or other impediments to horizontal clearance over the waterway downstream of the proposed bridge site.

4. *What is the most restrictive vertical clearance on the waterway? (This may be a fixed bridge downstream/upstream of the proposed structure, a low hanging power line downstream/upstream of the bridge(s), or it may be some other structure that limits vertical clearance. Sometimes the existing to-be-replaced bridge(s) is the most restrictive structure.*

   Upstream of the proposed bridge location the structure which creates the most restrictive vertical clearance in the closed position is the CSXT Hilton Bascule Bridge.

   a. Milepoint: 1.0 of the Northeast (Cape Fear) River

   b. Vertical clearance (bridge in closed position): 4 feet

   Upstream of the proposed bridge location the structure which creates the most restrictive vertical clearance in the resting position is the Isabel Holmes Bridge.

   c. Milepoint: 1.5 of the Northeast (Cape Fear) River

   d. Vertical clearance (bridge in closed position): 40 feet

Downstream of the proposed bridge location the structure which creates the most restrictive vertical clearance is an overhead transmission line.

a. Milepoint: 21.2 of the Cape Fear River

b. Vertical clearance: 216 feet

5. *Will the proposed bridge(s) become the most restrictive/obstructive structure across the waterway?*

No, the bridge will not become the most restrictive or obstructive structure across the waterway to the users of this portion of the waterway.

C. Waterway characteristics:

(All domestic bridge navigational clearances should be stated in linear feet in decimal form vs. feet and inches. All international bridge navigational clearances should be state in linear unit of measure as well as the metric equivalent).

1. *Various water stages: (Datum that is used).*

The various waterway stages are listed in Table 2 below. All data values are relative to North American Datum of 1988 (NAVD88). Elevations are from National Oceanic and Atmospheric Administration (NOAA) station 8658120 in Wilmington, NC near the Cape Fear Memorial Bridge is adjacent to the proposed bridge site.

TABLE 2

Waterway Stage		*Elevation (NAVD88)*
MHHW	Mean Higher – High Water	2.08 feet
MHW	Mean High Water	1.83 feet
MTL	Mean Tide Level	-0.31 feet
MSL	Mean Sea Level	-0.16 feet
DTL	Mean Diurnal Tide Level	-0.26 feet
MLW	Mean Low Water	-2.44 feet
MLLW	Mean Lower-Low Water	-2.60 feet
NAVD88	North American Vertical Datum of 1988	0.00

Source: https://tidesandcurrents.noaa.gov/stations.html?type=Datums

2. *Natural flow of the waterway including currents, waterway velocity, water direction, and velocity fluctuations (seasonal, daily, hourly, etc.), that might affect navigation.*

Tides are normally semi-diurnal on the waterway (2 lows, 2 highs daily cycles on average) and micro-tidal (tidal range < 2 meters). The waterway experiences both ebb and flood tidal flows, with direction and velocity of flow varying with tidal cycles. Generally, water flows east-west until reaching the confluence of the Northeast Cape Fear River and the Cape Fear River.

NOAA performed a Cape Fear River, NC survey in 2016 with results published in June 2019. The report made use of numerous observation stations for data

collection, one of which was CFR1605 located at USS North Carolina Battleship which is less than a mile upstream from the proposed bridge location. Speed and timing relative to the tidal day of mean maximum ebb current (MEC) and mean maximum flood current (MFC) at the near surface were:

MFC = 81.3 cm/s (1.58 knots)
MEC = 106.6 cm/s (2.07 knots)

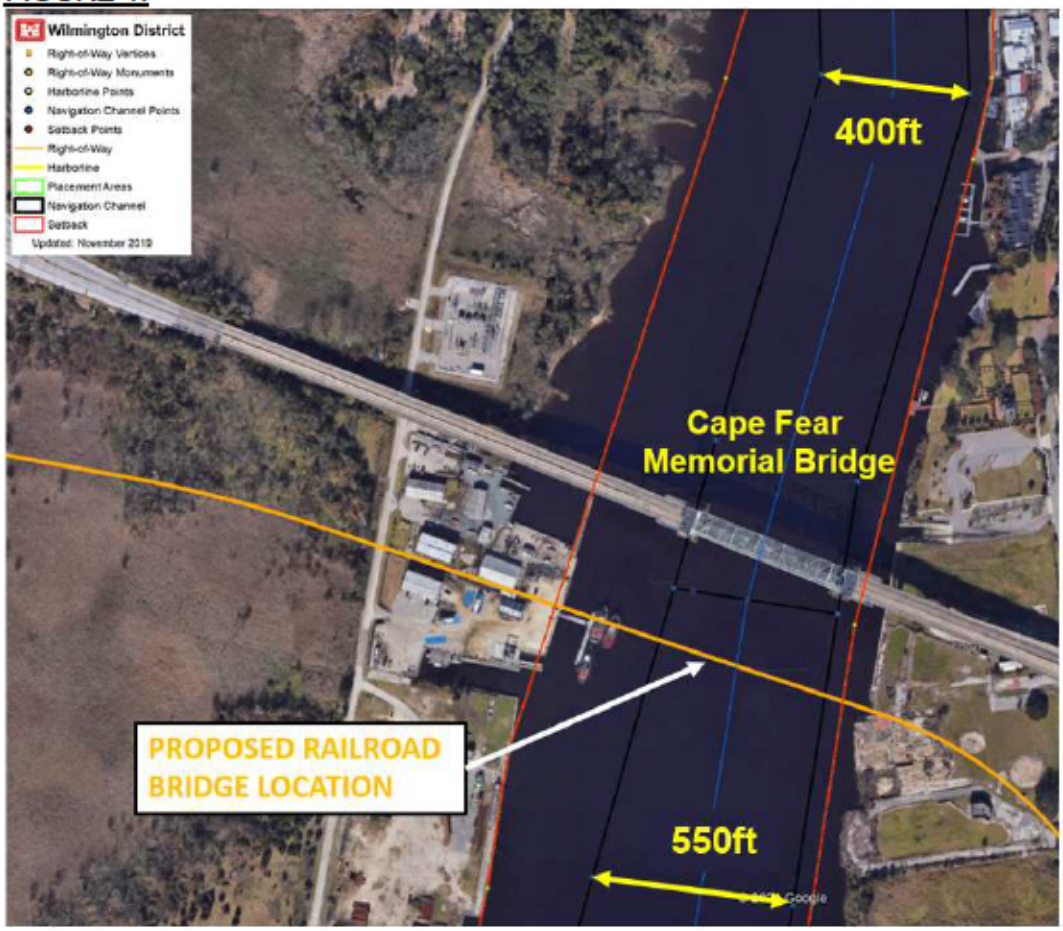
Source:
https://tidesandcurrents.noaa.gov/publications/Techrpt_089_Cape_Fear_Tech_Report_Final.pdf

3. *Width of the waterway at bridge site.*

The width of the waterway at the proposed bridge site is approximately 875 feet measured from the bulkhead at the Army Corps of Engineer's Repair Yard at 232 Battleship Rd NE, Leland, NC 28451, perpendicular to the navigational channel, to the bulkhead on the east bank of the river.

The width of the navigational channel as maintained by the United States Army Corp of Engineers (USACE) varies from 550 feet wide immediately downstream of the Cape Fear Memorial Bridge (Anchorage Basin) to 400 feet upstream of the Cape Fear Memorial Bridge (Battleship to Hwy 74/76 – Reach 5). See Figure 1 below.

FIGURE 1:



4. *Depth of the waterway and elevation fluctuations at bridge site: [List the depth at each waterway bridge stage (ex. Range of tides, average high water elevation, etc.)].*

   The depths of the waterway at various stages at the proposed bridge site(s) are depicted in Exhibit C. Generally the depths range from 38 feet to 42 feet at the proposed bridge site, with elevations referring to MLLW. As seen from data provided in C.1, waterway elevations vary 4.43 feet from MLLW to MHW.

   Sources
   https://www.saw.usace.army.mil/Missions/Navigation/Hydrographic-Surveys/Wilmington-Harbor/

5. *Waterway layout and geometry: (For example, is there a dam or lock, does the elevation of the approach impact the required bridge(s) clearance?)*

   There are no dams, locks or elevation changes along the waterway which are relevant to the proposed railroad bridge site.

   The Cape Fear River and the Northeast (Cape Fear) River meet approximately one mile north of the proposed railroad bridge site. Approximately four miles south of the proposed railroad bridge site the Cape Fear River meets with the Brunswick River and then proceeds approximately 22 additional miles south before emptying into the Atlantic Ocean.

6. *Channel and waterway alignment: Location of the channel(s).*

   The portion of the Cape Fear River in which the proposed railroad bridge site is located is generally oriented north-south. The proposed railroad bridge site lies immediately south of the existing Cape Fear Memorial Bridge (US 74/76) over the northern portion of the USACE maintained Anchorage Basin for the Wilmington Harbor. Within 200ft of the proposed railroad bridge site is the southernmost boundary of the Battleship to Hwy 74/76 – Reach 5 channel, also a part of the USACE Wilmington Harbor project. The Battleship to Hwy 74/76 – Reach 5 portion of the channel narrows to 400 feet as the river bends. South of the proposed railroad bridge site the maintained channel is straight for a considerable length. The proposed railroad bridge site is expected to align with a slight skew to the navigable channel, similar to the alignment which exists at the existing Cape Fear Memorial Bridge (US 74/76). Coordination between USCG, NCDOT and the City of Wilmington would further define the project site with channel and waterway alignment.

7. *Other limiting factors: (For example, bends in the waterway within one-half mile of the project site, hindrances to free navigation, fog, hydraulics, etc.).*

   There are no other known hindrances to free navigation within one-half mile of the proposed bridge sites. See NOAA Chart 11537 and appendices for additional information.

D. Do vessels that engage in emergency operations (i.e., law enforcement, fire, rescue, emergency dam repair, etc.), national defense activities (i.e. cruisers, fuel barges, munitions ships, etc.) or channel maintenance (i.e., dredges, dam and levee repair, etc.) operate on the waterway? If yes, describe the vessels and provide the following information:

1. *Does levee maintenance, bridge work (other bridges), channel maintenance and emergency operations upstream of bridge require certain vessels to transit the waterway?*

   No, per coordination with the NCDOT, USACE, USCG and other local agencies (see Exhibit H).

2. *Does the proposed bridge(s) impact USCG and/or other government vessels' ability to transit the bridge(s) to conduct mission essential functions (icebreakers, patrols, etc.)?*

   No, it is not expected that the proposed bridge would impact government vessels per coordination with USCG.

   Coast Guard Station Oak Island is the only Coast Guard unit that has the potential to operate in the area identified within in this Navigation Impact Report. USCG does have Aids to Navigation (ATON) in the area that require servicing (see D.3 for vessel information related to ATON service).

   Coast Guard Search and Rescue Station Oak Island generally does not conduct operations in the portion of waterway under study. USCG relies on other government agencies (OGA's) to assist in the area in the event of an emergency. In the event USCG response is required, they would utilize the 29' RBS-II which would not experience navigational restrictions based on the proposed railroad bridge recommendation.

3. *Vessels using the waterway during the proposed bridge(s) lifespan:*

   See Exhibit D for a full list of vessels using the waterway.

   <u>USCG 26160 (trailerable aids to navigation boat):</u>

   Vessel did not transit the waterway under study in 2019.

   i. Vessel name: Trailerable aids to navigation boat, CG 26160
   ii. Registration/documentation numbers: CG 26160
   iii. Vessel type: Outboard
   iv. Vessel owner contact information: USCG ANT Oak Island
   v. Primary vessel mooring location (include waterway milepoint, if known): 300A Caswell Beach Rd., Oak Island, NC 28465
   vi. Vessel overall length: 29' 7"
   vii. Vessel beam: 8' 4"

viii. Vessel draft (depth of hull below waterline at full load): 2' 9"
ix. Vessel air draft (height of the highest fixed point of the vessel above the waterline, when empty): 9' 0"
x. Safety margin required to by vessel to navigate through a bridge(s): 1'
xi. Vessel transit frequencies under proposed bridge(s), transit speeds and load configurations; and vessel characteristics (to include if tug assist is required for transit through the bridge(s) due to limited horizontal clearance): Frequency, not often deepening on discrepancy reports (expect average to be once every two months). Slow speed, light cargo that does not affect vessel maneuverability. No tugs or tows.

USCG CGC SMILAX Vessel:

Vessel did not transit the waterway under study in 2019.

i. Vessel name: SMILAX
ii. Registration/documentation numbers: Call sign NRYN
iii. Vessel type: Inland Construction Tender
iv. Vessel owner contact information: Coast Guard District Five
v. Primary vessel mooring location (include waterway milepoint, if known): SFO Fort Macon: 2301 E Fort Macon Rd, Atlantic Beach, NC
vi. Vessel overall length: 170'
vii. Vessel beam: 30'
viii. Vessel draft (depth of hull below waterline at full load): 6'
ix. Vessel air draft (height of the highest fixed point of the vessel above the waterline, when empty): 36' fixed, 54' unfixed at mast
x. Safety margin required to by vessel to navigate through a bridge(s): 90' horizontal clearance recommended for vessel size maneuverability
xi. Vessel transit frequencies under proposed bridge(s), transit speeds and load configurations; and vessel characteristics (to include if tug assist is required for transit through the bridge(s) due to limited horizontal clearance): Infrequent transits, less than three (3) times per year. Speeds of 6 to 8 kts, normal vessel load of pilings and ATON equipment, no tug assist needed to transit under bridge.

USCG Oak Island Vessel:

Vessel did not transit the waterway under study in 2019.

i. Vessel name: 29' RBS-II
ii. Registration/documentation numbers: CG 29216, CG29217
iii. Vessel type: Enclosed Cabin, outboards
iv. Vessel owner contact information: USCG Station Oak Island
v. Primary vessel mooring location (include waterway milepoint, if known): 300A Caswell Beach Rd., Oak Island, NC 28465
vi. Vessel overall length: 31' 7"
vii. Vessel beam: 8' 5"
viii. Vessel draft (depth of hull below waterline at full load): 2' 9" trimmed down, 1' 10" trimmed up
ix. Vessel air draft (height of the highest fixed point of the vessel above the waterline, when empty): 7' 10"

US Army's Sunny Point, NC firefighting and rescue vessel:

Vessel currently transits the waterway twice per year for scheduled maintenance (and as needed for emergency repairs) at the Cape Fear Boat Works located upstream from the proposed bridge locations. This is reflected in the 2019 AIS dataset.

i. Vessel name: Sunny Point
ii. Registration/documentation numbers: Vessel # CG 1167165, Galdding-Hearn Shipbuilding Hull Number 387
iii. Vessel type: Unclassified vessel, Aluminum, Jet Propulsion
iv. Vessel owner contact information: US Army, Military Ocean Terminal Sunny Point (MOTSU), Fire & Emergency Services Division /Chief Michael Scott / 6280 Sunny Point Rd. Southport, NC 28461 / 910-457-8218
v. Primary vessel mooring location (include waterway milepoint, if known): MOTSU Boat Basin / Buoy # 33 Cape Fear River
vi. Vessel overall length: 82' 6"
vii. Vessel beam: 20' 6"
viii. Vessel draft: 4' 2"
ix. Vessel air draft: 37' 3"

x. Does the vessel have limited maneuverability due to inherit design or mode of operation?: To operate one fire pump the vessel requires 6' of draft, 10' of draft to operate two pumps

4. *Will the proposed bridge(s) provide the horizontal and vertical clearances for the safe, efficient passage of the largest of these vessels? Why?*

   Yes. Horizontal and vertical clearances are no more restrictive than structures over the waterway which are presently transited by these vessels

5. *If no, estimate the number of vessels in each of the above categories unable to pass through the proposed bridge(s). Give the name, length overall (LOA), beam, draft and height of highest fixed point above the waterline for vessels affected by the bridge(s).*

   Not applicable.

6. *Can these vessels be modified (i.e., folding mast, relocation or equipment, etc.) without decreasing their respective response times? If so, name the vessels.*

   Not applicable.

7. *If modifications are feasible, state the name of the vessel(s), their trip frequency, the necessary modifications, the cost of the modification(s) and who will pay for them (i.e., vessel owner, applicant, other).*

   Not applicable.

8. *Provide any additional information concerning the potentially impacted or burdened users of the waterway as well as the future use of the waterway.*

   Not applicable.

E. Has the United States Corps of Engineers (USACE) completed or does it plan to complete a federal navigation project on the waterway? If yes, provide the following information:

Yes, USACE has completed a federal navigation project on the waterway.

1. *Project name, downstream/upstream milepoints, depth, type of project, scope, status of project and other limiting factors.*

   Project Name: Wilmington Harbor

   Channels:

38 FT MLLW	(UPPER) ANCHORAGE BASIN
32 FT MLLW	HWY 74-76 BRIDGE TO BATTLESHIP Reach 1, 2, 3, 4 & 5
32 FT MLLW	BATTLESHIP TO HWY 133 BRDIGE INCLUDING TURNING BASIN Reach 1, 2 & 3
32 FT MLLW	HWY 133 BRIDGE TO HILTON BRIDGE Reach 1, 2, 3 & 4
25 FT MLLW	25 FOOT PROJECT Reach 4

   Milepoints: Not applicable. See geographic references above.

   Depth: See Exhibit C

   Type: Federal Navigation Channel

   Status: Complete

2. *Whether there is/was a "design vessel" used in planning the channel? What is/was the design vessel? Was the design vessel reviewed by the Coast Guard?*

   No "design vessel" was identified for the navigation project.

3. *The following specification of the vessel for which the navigation project is or will be designed: LOA, beam, draft and height of the highest fixed point above waterline.*

   Not applicable.

4. *Will the proposed bridge(s) provide the horizontal and vertical clearances necessary for the safe, efficient passage of the vessel for which the navigation project was designed?*

   Not applicable.

5. *If so, can the vessel be modified to clear the proposed bridge(s) without substantially increasing operating costs?*

   Not applicable.

6. *If modifications are feasible, state the necessary modifications, costs of any modifications(s), who will pay for the modifications.*

   Not applicable

7. *Are the projected changes in the waterway usage based upon anticipated waterway improvement projects?*

   There are no projected changes for waterway usage based upon any waterway improvement projects.

8. *Does the proposed bridge impact USACE ability to transit the bridge in a Federal project channel?*

   There are no projected changes for waterway usage based upon any waterway improvement projects.

F. Describe the present and prospective recreational navigation:

Will the proposed bridge(s) affect the safe, efficient movement of any segment of the present or prospective recreational fleet operation on the waterway? If yes, provide the following information:

The proposed bridge will not affect the safe, efficient movement of recreational vessels over any segment of the waterway under study for this report presently or prospectively.

Exhibit D captures all vessels which appeared in the 2019 AIS dataset as well as all vessels which required a bridge lift at either the Cape Fear Memorial Bridge or the Isabel Holmes Bridge.

Summary statistics from Exhibit D for recreational vessels only are as follows:

Unique Vessel Count	209
% Sailboats	50%
Average Length (ft)	55
Max Length (ft)	164
Average Beam (ft)	19

Max Beam (ft)	52
CFMB Transits	296
CFMB Lifts	64
IHB Transits	81
IHB Lifts	121

CFMB = Cape Fear Memorial Bridge
IHB = Isabel Holmes Bridge

The data in Exhibit D demonstrates that while recreational vessels are significantly smaller than the commercial vessels which transit the waterway under study, they transit the waterway more frequently. Furthermore, it should be noted that sailboats accounted for 50% of all recreational vessel types in 2019, which is relevant to this study since they typically require greater vertical navigational clearances. Of the 64 total lifts required for creational vessels at the CFMB in 2019, 53 (83%) were for sailboats. The proportion was similar at the IHB with 102 (84%) of the 121 lifts resulting from sailboat transits.

Also of note, Exhibit F shows statistics from the City of Wilmington related to the usage of public docking facilities on the waterway from 2003 to 2019. The average vessel length from year to range from 25 feet to 38 feet. These statistics show an 84% decline in usage at the City's docks between 2016 and 2019. There are a number of private marinas in the Wilmington Harbor (see Section H) however data on usage related to these facilities is not available.

G. Describe the present and prospective commercial navigation and the cargoes moved on the waterway:

Will the proposed bridge(s) affect the safe, efficient movement of any segment of the present or prospective commercial fleet operating on the waterway? If yes, provide the following information:

The proposed bridge is not expected to affect the safe, efficient movement of commercial vessels over any segment of the waterway under study for this report presently or prospectively.

Exhibit D captures all vessels which appeared in the 2019 AIS dataset as well as all vessels which required a bridge lift at either the Cape Fear Memorial Bridge or the Isabel Holmes Bridge.

Summary statistics from Exhibit D for all non-recreational vessels (this would include search and rescue vessels, survey vessels, etc.) are as follows:

Unique Vessel Count	70
Average Length (ft)	277
Max Length (ft)	604
Average Beam (ft)	50
Max Beam (ft)	105
CFMB Transits	232
CFMB Lifts	117

IHB Transits	208
IHB Lifts	163

The largest of the vessels categorized as non-recreational are the tanker vessels / articulated pusher tug vessels which service the Kinder Morgan facility located on the east bank of the Northeast Cape Fear River immediately north of the CSXT Hilton Bascule Bridge. These vessels occur at a frequency of approximately once per week. The largest vessel dimensions observed were a length of 604 feet (4 unique vessels shared this length) and a beam of 105 feet which belonged to the Bunga Angsana traveling under a Malaysian flag. It should be noted that all of these vessels transit the Cape Fear Memorial Bridge, the Isabel Holmes Bridge and the CSXT Hilton Bascule Bridge to service the Kinder Morgan facility. These vessels carry chemicals, fertilizers and other related products (see Exhibit G for additional information on commerce statistics as reported by USACE).

Commercial vessels are restricted to mean high tide north of the Cape Fear Memorial Bridge (US 74/76) and a draft limitation 31 feet maximum.

Only one prospective use for by commercial vessels was identified – the inactive Cemex terminal located between the Isabel Holmes Bridge and the CSXT Hilton Bascule Bridge on the west bank of the Northeast (Cape Fear) River. According to local river pilots, this facility has been dormant for years up until early 2021. The pilots indicated that these vessels are of similar size to the vessels servicing the Kinder Morgan facility upstream and thus require the same navigational considerations as those vessels.

H. Identify the name and contact information for marine facilities located within a 3-mile radius of the proposed project (public boat ramps, marinas or major docking facilities, boat repair facilities, etc.:

1. Specialty Boat Works
   262 Battleship Rd NE
   Wilmington, NC 28401
   (910) 251-5219
   a.rusher@icloud.com
   https://m.facebook.com/pages/category/Sports---Recreation/Specialty-Boatworks-145601858803698/

2. Smith Creak Boatyard
   805 Cornelius Harnett Dr
   Wilmington, NC 28401
   (910) 443-5313
   harborlinesllc@aol.com
   http://www.smithcreekboatyard.com/

3. Bennet Brothers Yachts / Off the Hook Yacht Services

6. Sawmill Point Marina
   1015 Nutt Street
   Wilmington, NC 28401
   (833) 455-5003
   https://sawmillpoint.com

7. City of Wilmington Docks
   302 Willard Street
   Wilmington, NC 28401
   (910) 520-6875
   jonathan.batts@wilmingtonnc.gov
   https://www.wilmingtonnc.gov/departments/parks-recreation/docking

8. Cape Fear Community College
   411 N Front St
   Wilmington, NC 28401
   (910) 362-7403

1701 JEI Wade Dr
Wilmington, NC 28401
(910) 772-9277
service@offthehookys.com
https://service.offthehookyachts.com/

4. Industrial Hardware & Marine / Old Wilmington Shipyard, LLC
1551 Point Harbor Rd
Wilmington, NC 28401
(910) 343-8135
orders@ihmnc.com

5. Port City Marina
10 Harnett Street
Wilmington, NC 28401
(910) 620-9904
hello@usainvestco.com
https://portcitymarina.com/

jsrogers57@cfcc.edu
https://cfcc.edu/marine-technology/

9. Dram Tree Park Boat Ramp
W Castle St
Wilmington, NC 28401
(910) 520-6875
jonathan.batts@wilmingtonnc.gov
https://www.wilmingtonnc.gov/departments/parks-recreation/docking

10. Army Corps of Engineers
Wilmington District Repair Yard
232 Battleship Rd NE
Leland, NC 28451
(910) 251-4979
https://www.saw.usace.army.mil/Missions/Navigation/Engineer-Yard/

I. Will the proposed bridge(s) block access of any vessel presently using local service facilities (i.e., repair shops, parts distributors, fuel stations)? If yes, provide the following information:

The proposed bridge will be no more restrictive to vessels presently using the waterway to access local marine service facilities.

J. Are alternate routes bypassing the proposed bridge(s) available for use by vessels unable to pass the proposed bridge(s)? If yes, provide the following information:

No, there are no alternate navigable routes available for use by vessels unable to pass the proposed bridge.

K. Will the bridge(s) prohibit the entry of any vessels to the local harbor of refuge? If yes, describe the harbor and provide the following information:

No, the proposed railroad bridge will not prohibit the entry of any vessels to the local harbor of refuge.

L. Will the proposed bridge(s) be located within one-half mile of a bend in the waterway? If yes, describe the bend and provide the following information:

Yes, the proposed railroad bridge site is located within one-half mile of a bend in the waterway. Said bend is upstream and adjacent to the proposed bridge site.

1. *Is there sufficient distance between the bridge(s) and the bend to allow proper vessel alignment for the safe, efficient passage of vessels through the proposed bridge(s)?*

   Yes, there is sufficient distance between the bridge and the bend to allow proper vessel alignment for safe and efficient passage of vessels through the proposed bridge. The proposed horizontal navigational clearance was developed in collaboration with the Cape Fear River Pilots Association. Factors such as the waterway's geometry (i.e. the bend upstream and channel alignment), vessel characteristics and the potential for adverse atmospheric and hydraulic conditions were considered in the development of a horizontal clearance recommendation.

2. *If no, what factors make construction of the bridge(s) at an alternate location impractical?*

   Not applicable.

M. Are there other factors (i.e., dockages, lightering areas, existing bridges, etc.) located within one-half mile of the proposed bridge(s), which would create hazardous passage through the proposed structure? If yes, provide the following information:

1. *Describe the factors. (For example, construction impacts to navigation and waterway users, etc.)*

   The Cape Fear Memorial Bridge (CFMB) (US 74/76) is located within close proximity of the proposed railroad bridge site. For the purposes of this section of the report, it should be noted that proposed bridge in combination with the future, planned replacement CFMB has the potential to create a hazard to navigation dependent upon distance between the structures, relative skews to the waterway and other similar factors which at present are not known. Outreach to stakeholders revealed a preference for minimizing the distance between the proposed bridge the future replacement of the Cape Fear Memorial Bridge to enhance navigability. Combining the replacement of the CFMB with the proposed railroad bridge on a single substructure (with independent superstructures) would likely mitigate the hazard to navigation as considered in this section, and is being explored by the City of Wilmington and NCDOT.

   The North Carolina Department of Transportation (NCDOT) released an Express Design Summary in May of 2020 which presented four (4) options for the replacement of the CFMB. NCDOT states that the bridge will need to be replaced by 2030. It is anticipated that the proposed railroad bridge would be located within close

proximity of the replacement highway bridge, either on a shared substructure or entirely separated from the highway bridge.

An examination of navigational considerations such as current vessel usage and prospective vessel usage on the waterway was not conducted to inform NCDOT's Express Design Summary for the replacement of the CFMB. Since the Express Design Summary did not have the benefit of the data and analysis contained herein, the report assumed horizontal clearances consistent with the existing CFMB structure and varying proposals for vertical clearances, any of which may be carried forward by NCDOT into USCG's Bridge Permit Application Process.

Option 4 of the NCDOT's Express Design Summary contemplates a highway bridge with a moveable span alongside a single track moveable span railroad bridge, i.e. incorporating the Wilmington Rail Realignment Project (see Exhibit B for additional information). As described in the Express Design Summary, a single substructure would accommodate both the superstructure for the highway mode and the superstructure of the railway mode. The superstructures would operate independently of one another.

Local docking pilots have commented through communications with local USCG personnel and through the City of Wilmington that having two bridges (i.e. the proposed bridge and the replacement or existing CFMB) within close proximity with different horizontal navigational clearances (250ft & 350ft) could potentially increase the time it would take for a vessel to clear both bridges given that travel through the narrower clearance bridge would require reduced speeds which would need to be carried through passage of both structures. However, as previously discussed, outreach with the Cape Fear River Pilots Association and other stakeholders revealed a preference for minimizing the distance between the proposed bridge the future replacement of the Cape Fear Memorial Bridge to enhance navigability.

No other factors have been identified which are located within the navigable waterway within one-half mile of the proposed bridge.

Source: https://www.starnewsonline.com/news/20200514/4-options-chosen-for-wilmington-bridge-replacement

2. *What mitigative measures are being recommended? (For example, navigation safety during construction, etc.) Why?*

   None at this time, however, mitigative measures will be considered as the design for the proposed railroad bridge is refined with further guidance from USCG and USACE, and as NCDOT's plans for the replacement for the Cape Fear Memorial Bridge take shape.

N. Do local hydraulic conditions (i.e., wave chop, cross currents, tides, shoals, etc.) increase the hazard of passage through the proposed bridge(s)? If yes, provide the following information:

Local hydraulic conditions are not expected to increase the hazard of passage through the proposed bridge and were accounted for in preparing a recommendation for the horizontal clearances.

O. Do local atmospheric conditions (i.e., strong, prevailing winds, fog, rapidly developing storms, etc.) increase the hazard of passage through the proposed bridge(s)? If yes, provide the following information:

No, local atmospheric conditions are not expected to increase the hazard of passage through the proposed bridge and were accounted for in preparing a recommendation for the horizontal clearances.

1. *Describe the conditions:*

No conditions were identified.

2. *What mitigative measures are being recommended? Why?*

Not applicable.

P. Have guide clearances been established for the waterway? If yes, provide the following information:

Yes, guide clearances have been establish for the waterway upstream of the proposed railroad bridge site. Note that proposed railroad bridge site is located across the Cape Fear River while the guide clearance detailed below are applicable to the Northeast (Cape Fear) River approximately one mile upstream.

TABLE 3:
Cape Fear River, NC:

No.	Waterway	Bridge Type	Horizontal Clearance	Vertical Clearance	Reference Plane
26	Mouth to mile 2.75	Fixed or vertical Lift	200 ft.	135 ft.	Maximum HW
		Swing or bascule	200 ft.	5 ft. (closed) railroad	
				40 ft. (closed) highway	
26	Mile 2.75 to Lanes Ferry	Fixed or vertical Lift	60 ft.	50 ft,	Maximum HW
		Swing or bascule	60 ft.	5 ft. (closed)	

Source: https://www.dco.uscg.mil/Our-Organization/Assistant-Commandant-for-Prevention-Policy-CG-5P/Marine-Transportation-Systems-CG-5PW/Office-of-Bridge-Programs/Bridge-Guide-Clearances/

3. *Horizontal guide clearance;*

See Table 3 above.

4. Vertical guide clearance;

See Table 3 above.

5. Do the proposed bridge(s) clearances differ from these guide clearances?

Yes, the proposed bridge clearances differ from guide clearances in that they exceed the guidance for vertical clearances (unlimited in the open position and approximately 20 feet. in the closed position vs. the 5 feet. guidance for railroad bridges).

6. If yes, what factors justify deviating from these guide clearances?

The horizontal and vertical clearances for the proposed railroad bridge meets or exceeds the guidance for the Northeast (Cape Fear) River upstream of the proposed railroad bridge location.

Q. Are there other natural or man-made conditions that affect navigation (atmospherics, exclusion zones, etc.)?

There are no natural or man-made conditions that are known which affect navigation.

1. Describe the conditions:

The channel is maintained by USACE.

2. What mitigative measure are being recommended? Why?

None at this time.

R. State any other factors considered necessary for the safe, efficient passage of vessels through the proposed bridge(s)? Are clearance gauges needed? Why?

Fixed navigational lighting on the bridge to indicate channel perimeters. Clearance gauges should be used as a safety precaution. Information on the final bridge would be provided for inclusion in the US Coast Pilot and during construction through Notices to Mariners and other standard maritime information methods.

S. Include a description of the impacts to navigation caused or which could be reasonably caused by the proposed bridge(s) including but not limited to: proposed or prospective changes to the existing bridge(s) operating schedule (for movable bridges), and any proposed mitigation to all unavoidable impacts to navigation.

1. Conduct a navigational impact report, and include a review of all bridges upstream and downstream of the proposed site to determine the minimum vertical and horizontal clearances available on the waterway.

See Section B above.

2. If the proposed bridge is fixed, and is replacing an existing drawbridge with unlimited vertical clearance, the applicant must determine whether the proposed bridge will accommodate existing and prospective navigation.

Not applicable. Proposed bridge would be an additional structure, not a replacement and is also proposed as a moveable span bridge which would accommodate the existing and prospective navigation.

T. Is there any proposed or completed mitigation for impacted waterway users? Are there any impacts that cannot be mitigated?

No impacts to waterway users were identified as a result of the proposed bridge. Therefore, mitigation efforts are not proposed.

EXHIBIT A

Conceptual Engineering Drawing for the Proposed Railroad Bridge

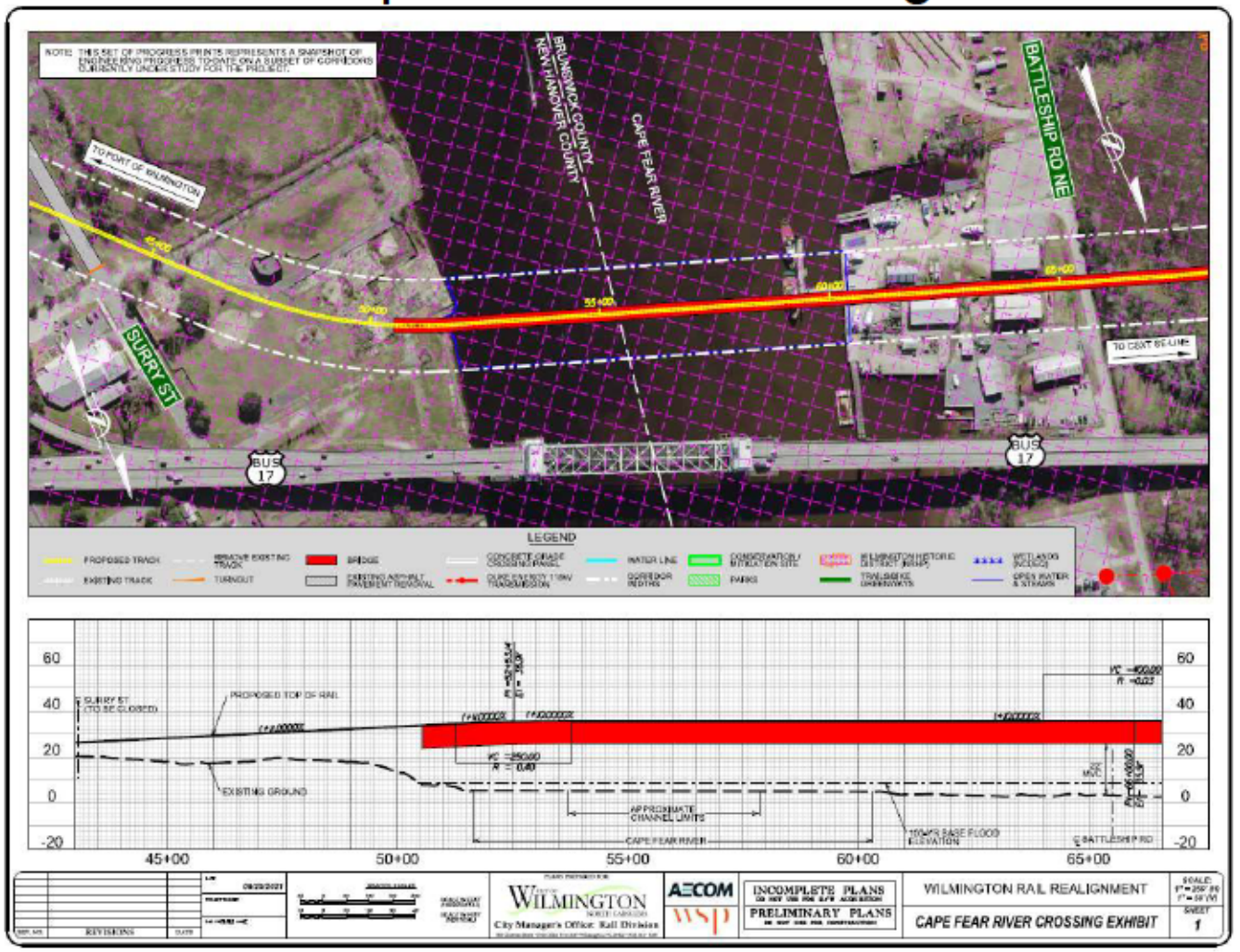


EXHIBIT B

NCDOT's Express Design Summary for the Replacement of the Cape Fear Memorial Bridge (US 74/76)

For the highest quality images, please visit:

https://www.starnewsonline.com/news/20200514/4-options-chosen-for-wilmington-bridge-replacement

EXHIBIT C
Hydrographic Surveys

For highest quality river survey imaging, please visit:

https://www.saw.usace.army.mil/Missions/Navigation/Hydrographic-Surveys/Wilmington-Harbor/

See "ANCHROAGE BASIN" with survey date March 24, 2021 and select the PDF for survey south of the existing Cape Fear Memorial Bridge.

See "32 FOOT PROJECT SOUTH" with survey date March 15, 2021 and select the PDF for survey immediately south of the existing Cape Fear Memorial Bridge north to confluence of the Cape Fear River with the Northeast Cape Fear River.

See "32 FOOT PROJECT NORTH" with survey date March 15, 2021 and select the PDF for survey which covers the Northeast Cape Fear River from its confluence with the Cape Fear River to the CSXT Hilton Bascule Railroad Bridge.

See "25 FOOT PROJECT" with survey date October 26, 2020 and select the PDF for survey beginning near the north end of the existing CSXT Hilton Bascule Railroad Bridge.

EXHIBIT D

Vessel Summary Compiled from 2019 AIS Data &
Bridge Lift Log Data

#	MMSI	Name	Type	Flag	Length (ft)	Beam (ft)	Max Draft (ft)	CFMB Lifts	IHB Lifts	CFMB Transits	IHB Transits
1	367362010	CORPUS CHRISTI	Articulated Pusher Tug	USA	604	72	31	2	2	1	1
2	538005779	NAVIG8 AMESSI	Tanker	Marshall Islands	604	89	48	2	2	1	1
3	538005772	NAVIG8 AMETHYST	Tanker C	Marshall Islands	604	89	39	2	2*	1	1
4	538005775	NAVIG8 ANDESINE	Tanker B	Marshall Islands	604	89	38	2	2	1	1
5	369262000	PAUL MCLERNAN	Spare - Local Vessel	USA	594	72	33	26	31	16	16
6	533051500	BUNGA ANGSANA	Oil / Chemical Tanker	Malaysia	590	105	35	2	2	1	1
7	220480000	BRITTA MAERSK	Oil / Chemical Tanker	Denmark	574	95	33	2	2	1	1
8	319155600	ULRIKEN	Oil / Chemical Tanker	Cayman Islands	571	89	38	2	2	1	1
9	369113000	BARBARA CAROL ANN MORAN	Spare - Local Vessel	USA	554	79	30	6	6	3	3
10	314444000	CAROLUS MAGNUS	Oil / Chemical Tanker	Barbados	541	79	33	2	2	1	1
11	314445000	ROSY	Oil / Chemical Tanker	Barbados	538	75	33	2	2	1	1
12	255804340	HARBOUR PIONEER	Oil / Chemical Tanker	Portugal	531	75	57	2	2	1	1
13	367115000	LINDA LEE BOUCHARD	Articulated Pusher Tug	USA	531	79	28	6	6	2	2
14	366843420	SEA HAWK	Spare - Local Vessel	USA	531	72	31	14	15	11	11
15	368009000	SCOTT TURECAMO	Articulated Pusher Tug	USA	512	75	56	2	2*	1	1
16	636015074	IVORY RAY	Oil / Chemical Tanker	Liberia	482	82	34	2	2	2	2
17	636016362	CHEM ALTAMIRA	Tanker	Liberia	476	79	33	2	2	1	1
18	564054000	BRO ALMA	Oil / Chemical Tanker	Singapore	472	75	31	2	2	1	1
19	220495000	BRO NIBE	Oil / Chemical Tanker	Denmark	472	75	30	2	2	1	1
20	636017426	CHEM ANTARES	Oil / Chemical Tanker	Liberia	472	79	36	2	2	1	1
21	255804280	HARBOUR FEATURE	Oil / Chemical Tanker	Portugal	472	75	43	2	2	2	2
22	249207000	PATALYA	Oil / Chemical Tanker	Malta	469	75	33	1	1*	1	1
23	367416750	BLUE FIN	Articulated Pusher Tug	USA	466	72	52	2	2	1	1
24	538005215	CHEM AMSTERDAM	Oil / Chemical Tanker	Marshall Islands	466	79	46	2	2	1	1
25	636015587	GOLDEN RAY	Oil / Chemical Tanker	Liberia	466	79	34	2	2	1	1
26	367469290	MAKO	Articulated Pusher Tug	USA	446	79	26	6	5	4	4
27	351778800	CHEMBULK JAKARTA	Oil / Chemical Tanker	Panama	436	79	NA	2	2	0	0
28	352182000	HAIJILI	Oil / Chemical Tanker	Panama	259	43	33	0	0	1	1
29	367438210	INDEPENDENCE	Passenger	USA	213	46	8	0	0	2	0
30	367267000	CG DILIGENCE	Law Enforcement	USA	210	30	31	7	0	3	0
31	367184740	AMERICAN STAR	Passenger	USA	197	46	7	0	0	2	0

#	MMSI	Name	Type	Flag	Length (ft)	Beam (ft)	Max Draft (ft)	CFMB Lifts	IHB Lifts	CFMB Transits	IHB Transits
32	369024000	GRANDE MARINER	Passenger	USA	184	43	7	0	0	1	0
33	369970571	MURDEN	Dredging or Underwater Ops	USA	164	66	6	0	0	1	0
34	338926428	CGNATHAN BRUCKENTHAL	Law Enforcement	USA	151	23	10	0	0	2	0
35	366929330	CAPE HATTERAS	Research / Survey Vessel	USA	134	39	10	0	12	15	0
36	367126620	CAPE HENRY	Tug	USA	112	26	13	0	5	8	8
37	366909510	MARGARET MCALLISTER	Tug	USA	108	26	7	0	10	14	11
38	367553370	PATRICK MCALLISTER	Towing	USA	105	33	13	0	1	1	1
39	367384520	ANNE JARRETT	Reserved for future use	USA	102	36	20	2	0	1	0
40	367199860	MAURANIA 3	Tug	USA	102	33	16	0	1	4	3
41	366962220	CAPE CHARLES	Tug	USA	98	23	NA	0	15	15	15
42	367005850	MISS ASHLEY	Tug	USA	98	26	7	0	2	0	0
43	366377000	TRANQUILITY	Towing	USA	98	NA	8	0	0	3	0
44	367126590	CAPE HATTERAS	Tug	USA	95	33	19	0	12	23	23
45	366922110	DEACON	Tug	USA	95	33	NA	0	3	0	0
46	367667560	SEA CRESCENT	Tug	USA	95	26	26	0	0	1	0
47	367049160	ERIN MCALLISTER	Tug	USA	89	33	41	0	7	13	12
48	369970445	MERRITT	Dredging or Underwater Ops	USA	85	33	7	0	0	3	0
49	367642480	CAMIE	Tug	USA	75	26	8	0	0	1	0
50	367501840	SUNNY POINT	Other Type	USA	75	26	NA	0	0	5	1
51	366939080	MISS SHELBY	Tug	USA	72	26	8	0	2	0	0
52	368077920	RANGER	Tug	USA	69	33	11	0	0	1	0
53	366961670	CAPT LEROY	Tug	USA	66	13	NA	0	11	0	0
54	367712460	R/V CAPE FEAR	Other Type	USA	66	20	NA	0	0	4	0
55	367044360	CAPE FEAR	Towing	USA	59	20	NA	0	4	8	11
56	366959780	PONCA	Tug	USA	59	13	NA	0	1	2	2
57	367666060	CAPE FEAR PILOT 3	Pilot Vessel	USA	56	20	NA	0	0	1	1
58	366996190	ISLAND FOX	Tug	USA	56	23	8	4	0	9	0
59	367473540	ROYAL ENGINEER	Towing	USA	52	26	8	3	2	13	1
60	319018500	ASPEN ALTERNATIVE	Yacht	Cayman Islands	50	8	22.3	0	0	2	0
61	368068410	SIRENUSE III	Pleasure Craft	USA	50	14	NA	0	0	1	1
62	366816340	CAPE FEAR PILOT 2	Pilot Vessel	USA	49	20	NA	0	0	1	1
63	338019000	CABERNET	Pleasure Craft	USA	47	10	NA	0	0	2	0

#	MMSI	Name	Type	Flag	Length (ft)	Beam (ft)	Max Draft (ft)	CFMB Lifts	IHB Lifts	CFMB Transits	IHB Transits
64	338115176	BILL SLAYER	Fishing	USA	46	16	NA	0	0	7	10
65	368059860	M/V CAZADOR	Pleasure Craft	USA	37	NA	3	0	0	2	0
66	378353000	& YACHT SCARLET	Pleasure Craft	BVI	34	16	NA	0	0	1	0
67	367713690	R/V SEAHAWK	Other Type	USA	34	12	3	0	0	2	0
68	338222072	EL DORADO	Fishing	USA	33	10	NA	0	0	2	0
69	338179748	OUTNUMBERED	Pleasure Craft	USA	31	6	NA	0	0	1	0
70	367796330	LETTAMELINA	Pleasure Craft	USA	30	8	NA	0	0	5	0
71	367594960	SOUTHERN BELLE	Pleasure Craft	USA	29	8	7.4	0	0	7	0
72	225988673	NAO SANTA MARIA	Pleasure Craft	Spain	28	8	NA	2	0	2	0
73	338097574	SPREZZATURA	Pleasure Craft	USA	27	6	NA	0	0	2	0
74	338926874	CG26274	Search and Rescue	USA	26	10	3	0	0	1	0
75	367795830	NEVER MY LOVE	Pleasure Craft	USA	26	7	NA	0	0	2	0
76	369302000	NEXT DEAL	Pleasure Craft	USA	26	4	NA	0	0	1	1
77	338122714	SEA MACK	Pleasure Craft	USA	25	7	NA	0	0	2	2
78	369164000	SWEETWATER	Pleasure Craft	USA	25	9	NA	0	0	4	0
79	367654040	POMBOO	Pleasure Craft	USA	23	8	NA	0	0	2	0
80	368053030	ANTARES	Pleasure Craft	USA	22	5	NA	0	0	2	1
81	367695960	BEST REVENGE	Pleasure Craft	USA	22	5	NA	0	0	1	3
82	367643510	DAMN NANCY	Pleasure Craft	USA	22	6	NA	0	0	1	1
83	338108969	GEM	Pleasure Craft	USA	22	6	NA	0	0	2	0
84	338180788	KNEE DEEP	Pleasure Craft	USA	21	7	NA	0	0	3	0
85	211811860	YES	Pleasure Craft	Germany	21	6	3.8	0	0	2	0
86	338223978	G FORCE	Pleasure Craft	USA	20	5	NA	0	0	1	0
87	338301061	JOLLY MON III	Pleasure Craft	USA	20	6	NA	0	0	4	0
88	338330064	ROBINS NEST	Pleasure Craft	USA	20	5	NA	0	0	2	2
89	338324416	SOMERSET	Pleasure Craft	USA	20	5	NA	0	0	1	0
90	338330523	FAMILY TRADITION	Pleasure Craft	USA	19	6	NA	0	0	6	5
91	338076478	NORTH STAR II	Pleasure Craft	USA	19	6	2	0	0	2	0
92	339759000	ZARPE	Pleasure Craft	Jamaica	19	6	2	0	0	1	0
93	338082472	APAISER	Pleasure Craft	USA	18	5	1.6	0	0	1	0
94	367747760	FAST BETTY	Pleasure Craft	USA	18	6	NA	0	0	2	1
95	367094530	FREE RANGE CHICKEN	Sailing	USA	18	5	NA	3	3	2	2

#	MMSI	Name	Type	Flag	Length (ft)	Beam (ft)	Max Draft (ft)	CFMB Lifts	IHB Lifts	CFMB Transits	IHB Transits
96	338209811	M/Y SEA CHANGE	Pleasure Craft	USA	18	6	NA	0	0	4	1
97	338207029	PHANTHOM	Pleasure Craft	USA	18	6	NA	0	0	2	2
98	338177776	SIDEKICK	Pleasure Craft	USA	18	6	NA	0	0	2	0
99	366897460	ALLY DEE	Pleasure Craft	USA	17	6	NA	0	0	1	1
100	368001660	CONSULTING TIME III	Pleasure Craft	USA	17	6	NA	0	0	1	1
101	338205762	JEN EM	Pleasure Craft	USA	17	5	NA	0	0	2	2
102	338304133	JOURNEY	Pleasure Craft	USA	17	7	NA	0	0	3	0
103	368055780	KALLIOPE	Sailing	USA	17	5	NA	0	0	1	1
104	338204565	KARINE	Pleasure Craft	USA	17	4	NA	0	0	1	1
105	338090282	LAST CHANCE	Pleasure Craft	USA	17	6	NA	0	0	1	0
106	367637640	MOONLIGHT	Sailing	USA	17	6	NA	0	0	2	0
107	338323386	NAUTICAL DREAMER	Pleasure Craft	USA	17	5	NA	0	0	2	0
108	338303156	PERFEITA	Pleasure Craft	USA	17	5	NA	0	0	2	2
109	338328718	ALANI	Pleasure Craft	USA	16	8	NA	2	3	2	0
110	367728450	BRANDY	Pleasure Craft	USA	16	6	4	0	0	2	0
111	367766370	CLARITY	Sailing	USA	16	8	NA	1	0	1	0
112	338338074	FIREFLY	Pleasure Craft	USA	16	8	NA	4	0	4	0
113	367713280	SALT N LIGHT	Pleasure Craft	USA	16	6	NA	0	0	4	4
114	367585630	SPIRIT	Pleasure Craft	USA	16	6	NA	0	0	2	2
115	367768550	TO THE MAX	Pleasure Craft	USA	16	6	NA	0	0	3	3
116	338237526	VOYAGER	Sailing	USA	16	8	NA	0	1	1	1
117	367765830	BLUEMOON	Pleasure Craft	USA	15	6	NA	0	0	1	0
118	368086640	BLUEMOON	Pleasure Craft	USA	15	6	NA	0	0	1	0
119	367664250	DELFINA	Sailing	USA	15	4	NA	0	2	2	2
120	338304806	DIFFERENT DRUMMER	Pleasure Craft	USA	15	5	NA	0	0	3	0
121	338180905	ESCAPE	Pleasure Craft	USA	15	5	NA	0	0	1	0
122	367464120	FIVE O CLOCK	Pleasure Craft	USA	15	5	NA	0	0	1	0
123	338183911	FOREVER YOUNG	Pleasure Craft	USA	15	5	NA	0	0	12	5
124	367530680	FULL MONTY	Sailing	USA	15	8	NA	2	1	2	2
125	338152546	GS LOLLIPOP IV	Pleasure Craft	USA	15	5	NA	0	0	4	0
126	367663260	LECHEILE	Pleasure Craft	USA	15	4	NA	0	0	1	0
127	316040216	LES VOGUER	Pleasure Craft	Canada	15	6	1.8	0	0	2	0

#	MMSI	Name	Type	Flag	Length (ft)	Beam (ft)	Max Draft (ft)	CFMB Lifts	IHB Lifts	CFMB Transits	IHB Transits
128	338350963	LILY GRACE	Pleasure Craft	USA	15	4	NA	0	0	3	2
129	211705870	LULLABYE	Pleasure Craft	Germany	15	5	NA	0	0	1	1
130	338144808	MADRINE	Pleasure Craft	USA	15	3	NA	0	0	2	0
131	367502860	MARCO POLO	Sailing	USA	15	4	NA	0	0	6	0
132	366834110	PACHIS	Pleasure Craft	USA	15	5	1.5	0	0	2	0
133	368073970	PAPILLON	Pleasure Craft	USA	15	6	NA	0	0	2	0
134	368100490	PAWSEIDON	Pleasure Craft	USA	15	4	NA	0	0	1	0
135	338205733	AHULLYACHTAFUN	Pleasure Craft	USA	14	6	NA	0	0	4	0
136	338230775	DON'T THINK TWICE	Pleasure Craft	USA	14	6	NA	0	0	2	0
137	338328525	FARMER'S RETREAT	Pleasure Craft	USA	14	5	NA	0	0	2	0
138	367688590	FOXHOLE	Pleasure Craft	USA	14	6	NA	0	0	2	0
139	338338916	INDIGO II	Pleasure Craft	USA	14	6	NA	0	6	1	1
140	338236607	INTEGRITY	Pleasure Craft	USA	14	4	NA	0	0	1	0
141	338334548	KINVARA II	Pleasure Craft	USA	14	6	NA	0	0	2	0
142	367155120	KOHINA	Sailing	USA	14	6	NA	0	0	4	0
143	368009980	LUSCA	Pleasure Craft	USA	14	7	NA	0	0	3	0
144	211770800	NOMAD	Pleasure Craft	Germany	14	5	NA	0	0	2	0
145	367797070	PAPIANA	Sailing	USA	14	9	NA	2	0	2	0
146	368037470	REMEDY	Sailing	USA	14	8	NA	0	0	2	0
147	232012541	SAUL GOODMAN	Pleasure Craft	United Kingdom	14	8	NA	0	0	2	0
148	368110860	SEASCAPE	Sailing	USA	14	8	NA	0	0	1	1
149	338328994	STARDUST	Pleasure Craft	USA	14	4	NA	0	0	4	2
150	368077930	SUNDANCE	Pleasure Craft	USA	14	6	NA	0	4	2	0
151	368060350	360 DEGREES	Sailing	USA	13	8	NA	2	0	2	0
152	367649140	AN ALARC H	Sailing	USA	13	5	NA	0	0	1	0
153	368116150	AS YOU WISH	Sailing	USA	13	8	NA	2	0	1	0
154	367462710	BUMPER CROP	Pleasure Craft	USA	13	4	NA	0	0	1	0
155	316029431	DAGNY	Sailing	USA	13	4	NA	2	0	1	0
156	367596430	ESCAPADE	Pleasure Craft	USA	13	5	NA	0	0	1	1
157	316028384	FALCO	Pleasure Craft	Canada	13	4	NA	0	1	1	0
158	368048370	GABRIELLA	Sailing	USA	13	4	NA	0	0	2	0
159	367794240	GIRO	Sailing	USA	13	8	NA	0	1	2	2

#	MMSI	Name	Type	Flag	Length (ft)	Beam (ft)	Max Draft (ft)	CFMB Lifts	IHB Lifts	CFMB Transits	IHB Transits
160	338310059	MISTY	Pleasure Craft	USA	13	4	NA	0	0	2	0
161	368077210	OHANA KAI	Pleasure Craft	USA	13	8	NA	1	0	1	0
162	367758330	PANORAMA	Sailing	USA	13	7	NA	0	0	1	0
163	338126999	PIPER CLEMENTINE	Pleasure Craft	USA	13	4	NA	0	0	1	0
164	338325114	PURA VIDA	Pleasure Craft	USA	13	4	NA	0	0	5	5
165	338336795	RHAPSODY	Pleasure Craft	USA	13	4	NA	0	0	2	0
166	367033160	SATORI	Sailing	USA	13	4	NA	0	0	1	0
167	368009970	SOLMATES	Sailing	USA	13	3	NA	0	0	1	0
168	367671250	TERANGA	Sailing	USA	13	4	NA	0	1	2	1
169	338232498	WATERLILY	Pleasure Craft	USA	13	5	NA	0	0	1	0
170	265695350	ZIROCCO	Sailing	Sweden	13	4	NA	0	1	2	1
171	338324168	ALYSANA	Pleasure Craft	USA	12	4	NA	0	0	2	2
172	368052750	AMAROK	Pleasure Craft	USA	12	4	NA	0	0	2	0
173	369044000	JULE III	Sailing	USA	12	4	NA	0	0	2	0
174	338324601	JULE OF THE SEA	Sailing	USA	12	4	NA	0	0	2	0
175	367638350	LA BELLA VITA	Sailing	USA	12	6	NA	0	0	9	0
176	316026363	MIGRATOR 1	Pleasure Craft	Canada	12	4	NA	0	0	1	0
177	338324433	SEA EAGLE	Pleasure Craft	USA	12	4	NA	0	0	1	0
178	338205201	STELLA	Pleasure Craft	USA	12	4	NA	0	0	2	0
179	338186597	TRAVELER	Pleasure Craft	USA	12	4	NA	0	0	2	2
180	367066460	TWOCAN	Pleasure Craft	USA	12	4	NA	0	0	1	0
181	367753190	WAXY	Sailing	USA	12	4	NA	0	0	2	0
182	367655360	ANCON	Pleasure Craft	USA	11	4	NA	0	0	2	0
183	338240807	GUMP STUMP	Pleasure Craft	USA	11	4	NA	0	0	2	0
184	338096053	YAWATEG	Sailing	USA	11	3	NA	0	1	1	1
185	316027819	ALTERA	Sailing	Canada	10	4	NA	0	2	1	0
186	338125806	MARADEL	Pleasure Craft	USA	10	4	NA	0	0	2	0
187	367452320	QUINITA	Sailing	USA	10	6	NA	0	0	1	0
188	368045070	LAST TANGO	Pleasure Craft	USA	9	4	NA	0	0	2	0
189	368069690	SEA SHANTY	Pleasure Craft	USA	9	3	NA	0	0	2	0
190	367683680	CAPT HENRY RAY	Not Available	USA	8	4	NA	0	0	2	2
191	338332418	STARDUST	Pleasure Craft	USA	8	4	NA	0	0	1	0

#	MMSI	Name	Type	Flag	Length (ft)	Beam (ft)	Max Draft (ft)	CFMB Lifts	IHB Lifts	CFMB Transits	IHB Transits
192	NA	ARGONAUT	Sailing	NA	NA	NA	NA	0	1	0	0
193	NA	ATC 21	Barge (non-propelled)	NA	NA	NA	NA	0	4	0	0
194	NA	AVENTYR	Sailing	NA	NA	NA	NA	2	3	0	0
195	366950440	BAYOU BRAVE	Tug	USA	NA	NA	NA	0	4	3	3
196	368094510	BELLE	Pleasure Craft	USA	NA	NA	NA	0	0	1	1
197	NA	BIG EZ	Sailing	NA	NA	NA	NA	3	3	0	0
198	NA	BISHOP III	Sailing	NA	NA	NA	NA	1	1	0	0
199	NA	BRAVEHEART	Sailing	NA	NA	NA	NA	0	1	0	0
200	NA	CALLIOPI	Sailing	NA	NA	NA	NA	0	1	0	0
201	NA	CARDUFF	Sailing	NA	NA	NA	NA	0	2	0	0
202	NA	CARIBBEAN DREAM	Sailing	NA	NA	NA	NA	1	2	0	0
203	367444230	CAROLINA GIRL	Pleasure Craft	USA	NA	NA	NA	2	3	2	2
204	NA	CHRISTABEL I	Sailing	NA	NA	NA	NA	0	1	0	0
205	NA	CORDILIA	Sailing	NA	NA	NA	NA	0	1	0	0
206	NA	COVERED	Sailing	NA	NA	NA	NA	0	3	0	0
207	NA	DAGNY	Sailing	NA	NA	NA	NA	2	0	0	0
208	NA	DAYO	Sailing	NA	NA	NA	NA	5	5	0	0
209	NA	DURANGO	Sailing	NA	NA	NA	NA	0	1	0	0
210	NA	ELUSIVE	Sailing	NA	NA	NA	NA	0	1	0	0
211	NA	ENDAXY	Sailing	NA	NA	NA	NA	0	1	0	0
212	NA	EYRA	Sailing	NA	NA	NA	NA	0	7	0	0
213	NA	FAIR WIND	Sailing	NA	NA	NA	NA	1	0	0	0
214	NA	FAT CAT	Sailing	NA	NA	NA	NA	0	1	0	0
215	NA	FORMONA	Sailing	NA	NA	NA	NA	0	1	0	0
216	NA	FRESH BREEZE	Sailing	NA	NA	NA	NA	0	1	0	0
217	NA	JADE	Sailing	NA	NA	NA	NA	1	2	0	0
218	368072130	JOURNEY ON	Pleasure Craft	USA	NA	NA	NA	0	0	2	0
219	NA	KATMANDU	Sailing	NA	NA	NA	NA	1	2	0	0
220	NA	KEEL JOY	Sailing	NA	NA	NA	NA	0	2	0	0
221	316029052	KING AND I	Pleasure Craft	Canada	NA	NA	NA	0	0	2	0
222	NA	KUDU	Sailing	NA	NA	NA	NA	0	1	0	0
223	NA	LANDSCAPE	Sailing	NA	NA	NA	NA	1	3	0	0

#	MMSI	Name	Type	Flag	Length (ft)	Beam (ft)	Max Draft (ft)	CFMB Lifts	IHB Lifts	CFMB Transits	IHB Transits
224	NA	LATITUDE	Sailing	NA	NA	NA	NA	1	0	0	0
225	NA	LEAWARD	Sailing	NA	NA	NA	NA	1	0	0	0
226	NA	LOANA	Sailing	NA	NA	NA	NA	0	1	0	0
227	NA	LOUISIANA	Barge (non-propelled)	NA	NA	NA	NA	0	4	0	0
228	NA	LOURANNE	Sailing	NA	NA	NA	NA	0	1	0	0
229	338314632	LOVELY LADY	Pleasure Craft	USA	NA	NA	NA	0	0	3	0
230	NA	MA CHERIE	Sailing	NA	NA	NA	NA	0	3	0	0
231	NA	MAIA	Sailing	NA	NA	NA	NA	0	2	0	0
232	NA	MARBELLA	Sailing	NA	NA	NA	NA	0	1	0	0
233	NA	MARI'S LEONARDO	Sailing	NA	NA	NA	NA	0	2	0	0
234	NA	MARY DOLL	Sailing	NA	NA	NA	NA	1	1	0	0
235	NA	MERYGOLD	Sailing	NA	NA	NA	NA	0	1	0	0
236	NA	MIAHA	Sailing	NA	NA	NA	NA	0	1	0	0
237	367192120	MIGRATION	Pleasure Craft	USA	NA	NA	NA	0	0	2	2
238	NA	MOODY	Sailing	NA	NA	NA	NA	0	1	0	0
239	368080840	MOONPEARL	Pleasure Craft	USA	NA	NA	NA	0	2	2	0
240	NA	MOONRAKER	Sailing	NA	NA	NA	NA	0	1	0	0
241	NA	MUOI	Sailing	NA	NA	NA	NA	1	0	0	0
242	367384540	NA	NA	NA	NA	NA	NA	0	0	1	1
243	367545660	NA	NA	NA	NA	NA	NA	0	0	1	1
244	338153674	NA	NA	NA	NA	NA	NA	0	0	1	1
245	NA	NC E197 WLM	Sailing	NA	NA	NA	NA	0	1	0	0
246	NA	NESUS	Sailing	NA	NA	NA	NA	2	0	0	0
247	NA	NINA	Sailing	NA	NA	NA	NA	2	0	0	0
248	NA	PAU HANA	Sailing	NA	NA	NA	NA	1	0	0	0
249	NA	PEACE LOVE & HAPPINESS	Sailing	NA	NA	NA	NA	0	2	0	0
250	368011570	PHOENIX	Sailing	USA	NA	NA	NA	0	0	2	0
251	NA	PIECES	Sailing	NA	NA	NA	NA	0	1	0	0
252	NA	PL&S	Sailing	NA	NA	NA	NA	0	1	0	0
253	NA	QUEST	Sailing	NA	NA	NA	NA	0	7	0	0
254	NA	REMANI	Sailing	NA	NA	NA	NA	1	0	0	0
255	NA	ROCKIN ROBBIN	Sailing	NA	NA	NA	NA	1	1	0	0

#	MMSI	Name	Type	Flag	Length (ft)	Beam (ft)	Max Draft (ft)	CFMB Lifts	IHB Lifts	CFMB Transits	IHB Transits
256	338224804	SCALIWAG	Pleasure Craft	USA	NA	NA	NA	0	0	1	0
257	NA	SEA COW	Sailing	NA	NA	NA	NA	1	1	0	0
258	NA	SEA TOW 10	Commercial / Towing	NA	NA	NA	NA	0	1	0	0
259	NA	SEAS THE DAY	Sailing	NA	NA	NA	NA	0	1	0	0
260	NA	SIRICO	Sailing	NA	NA	NA	NA	1	0	0	0
261	338154994	SMOOTH	Pleasure Craft	USA	NA	NA	NA	0	0	5	0
262	NA	SOUTHERN CHARM	Commercial	NA	NA	NA	NA	0	2	0	0
263	NA	SQIRIGA	Sailing	NA	NA	NA	NA	1	0	0	0
264	NA	STORMY MONDAY	Sailing	NA	NA	NA	NA	0	1	0	0
265	NA	SUBLIME	Sailing	NA	NA	NA	NA	1	1	0	0
266	NA	THREE JESTERS	Sailing	NA	NA	NA	NA	0	1	0	0
267	NA	TOW BOAT US	Commercial / Towing	NA	NA	NA	NA	0	4	0	0
268	NA	TWO GRAND	Sailing	NA	NA	NA	NA	0	1	0	0
269	338173625	VA BENE	Sailing	USA	NA	NA	NA	2	0	2	0
270	NA	VERRICCO	Sailing	NA	NA	NA	NA	1	0	0	0
271	NA	VISION III	Sailing	NA	NA	NA	NA	1	1	0	0
272	NA	VIVID	Sailing	NA	NA	NA	NA	0	1	0	0
273	NA	VOYAGER	Sailing	NA	NA	NA	NA	0	1	0	0
274	NA	WALLFLOWER	Sailing	NA	NA	NA	NA	1	0	0	0
275	NA	WATER SONG	Sailing	NA	NA	NA	NA	0	2	0	0
276	NA	WHITE DREAM	Sailing	NA	NA	NA	NA	1	0	0	0
277	NA	WHITE LOTUS	Sailing	NA	NA	NA	NA	0	1	0	0
278	367721980	WONCE MORE	Pleasure Craft	USA	NA	NA	6	0	0	1	0
279	NA	Y DREAM	Sailing	NA	NA	NA	NA	0	2	0	0

Notes:
*Fields updated per counsel from Cape Fear River Pilots Association and other precedents in the dataset.
See Exhibit E for information related to AIS.

EXHIBIT E
Automatic Identification System (AIS) Information

The automatic identification system (AIS) is an automatic tracking system that uses transceivers on vessels to track their positions to enable safer navigation and enhance reporting. AIS data is available to the public and is advertised for use for planning purposes. With tools and assistance from MarineCadstre.gov the AIS data can used to display vessel traffic characteristics and frequencies.

For the purposes of this report, the last full year of available AIS data was used which was 2019.

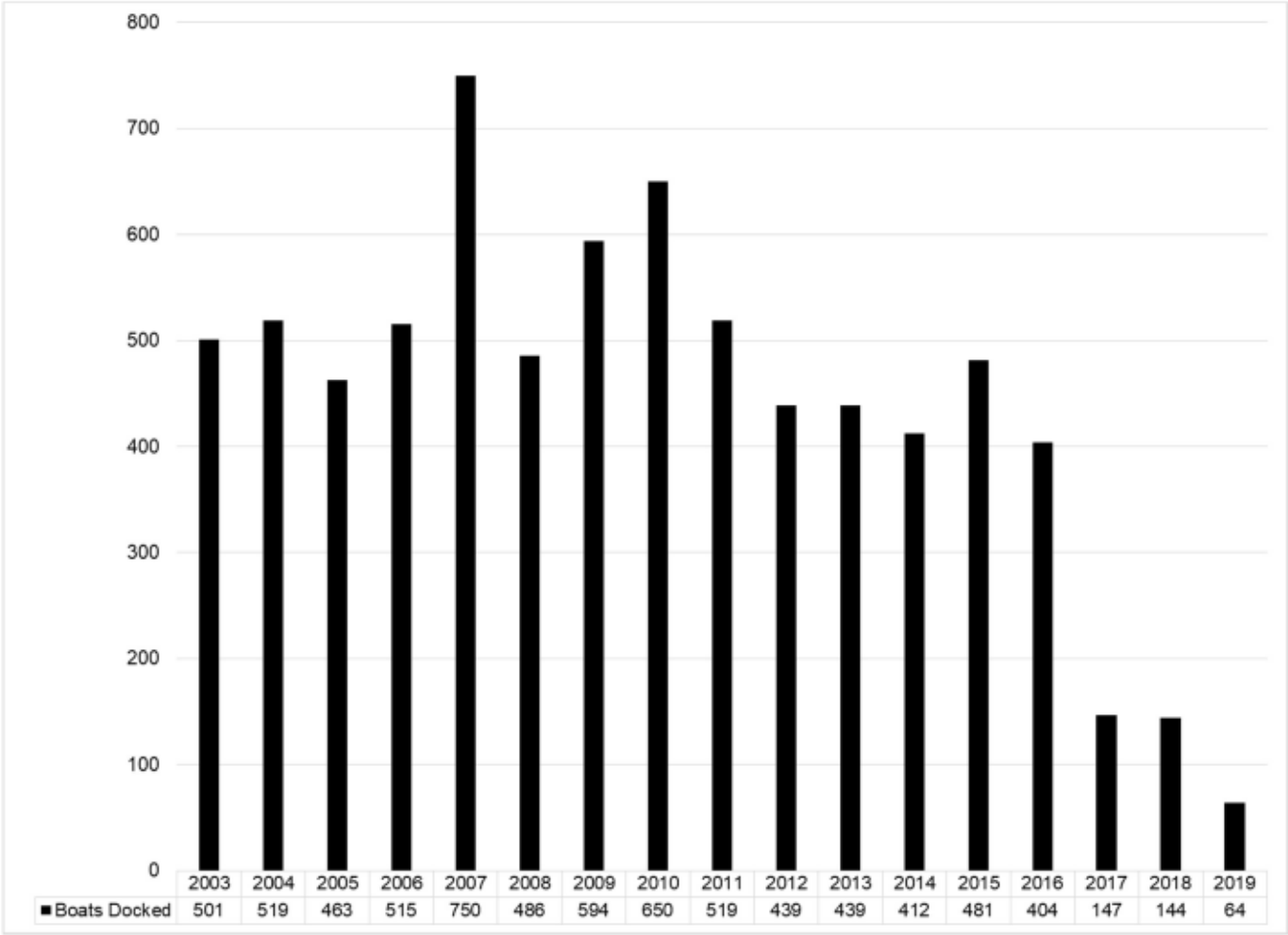
Use of AIS data in assessing recreational and commercial waterway usage is fitting given the requirements set forth in Code of Federal Regulations, Title 33 § 164.01(b) which, in summary, require AIS carriage on the following vessels:

- A self-propelled vessel of 65 feet or more in length, engaged in commercial service.
- A towing vessel of 26 feet or more in length and more than 600 horsepower, engaged in commercial service.
- A self-propelled vessel that is certificated to carry more than 150 passengers.
- A self-propelled vessel that carries less than 150 passengers, does not operate in a Vessel Traffic Service or Vessel Movement Reporting System area defined in Table 161.12(c) of § 161.12, and does not operate at speeds in excess of 14 knots.
- A self-propelled vessel engaged in dredging operations in or near a commercial channel or shipping fairway in a manner likely to restrict or affect navigation of other vessels.
- A self-propelled vessel engaged in the movement of (1) certain dangerous cargo as defined in subpart C of part 160 of this chapter, or (2) flammable or combustible liquid cargo in bulk that is listed in 46 CFR 30.25–1, Table 30.25–1.
- Fishing industry vessels

Source: https://www.navcen.uscg.gov/?pageName=AISRequirementsRev
Title 33, Code of Federal Regulations Section 164

EXHIBIT F

City of Wilmington Facilities
Docking Usage Statistics 2003 – 2019



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Boats Docked	501	519	463	515	750	486	594	650	519	439	439	412	481	404	147	144	64

EXHIBIT G

USACE 2019 Cargo & Trip Reports
Northeast (Cape Fear) River, NC

2019 Trips Report (Excerpt)

	All Traffic Types			Self-Propelled Tanker			Self-Propelled Towboat			Non-Self-Propelled Tanker Liquid Barge		
Draft (ft)	Total	Receipts	Shipments	Total	Receipts	Shipments	Total	Receipts	Shipments	Total	Receipts	Shipments
0	133	68	65	39	19	20	39	20	19	51	28	23
7	58	27	31	0	0	0	36	17	19	22	10	12
9	3	1	2	0	0	0	0	0	0	0	0	0
10	2	1	1	0	0	0	0	0	0	2	1	1
14	15	8	7	1	0	1	0	0	0	14	8	6
15	5	3	2	5	3	2	0	0	0	0	0	0
16	5	4	1	0	0	0	3	3	0	2	1	1
17	2	1	1	2	1	1	0	0	0	0	0	0
18	1	0	1	1	0	1	0	0	0	0	0	0
19	1	1	0	0	0	0	0	0	0	1	1	0
20	2	2	0	2	2	0	0	0	0	0	0	0
21	5	1	4	4	0	4	0	0	0	1	1	0
22	1	1	0	1	1	0	0	0	0	0	0	0
23	3	3	0	2	2	0	0	0	0	1	1	0
24	1	1	0	1	1	0	0	0	0	0	0	0
25	5	1	4	3	0	3	0	0	0	2	1	1
26	3	3	0	2	2	0	0	0	0	1	1	0
27	5	2	3	4	1	3	0	0	0	1	1	0

28	7	3	4	2	1	1	0	0	0	4	2	2
29	2	0	2	2	0	2	0	0	0	0	0	0
30	3	2	1	3	2	1	0	0	0	0	0	0
33	2	1	1	2	1	1	0	0	0	0	0	0
34	1	1	0	1	1	0	0	0	0	0	0	0
36	1	1	0	1	1	0	0	0	0	0	0	0

Note: For full report please visit the source link below. This excerpt excludes fields for Non-Self Propelled Dry Cargo Barge because there were zero trip reported, and excludes Self-Propelled Dry Cargo because only two trips were reported (one vessel with zero feet of draft and another with 28 feet of draft).

2019 Cargo Report

	All Traffic Types				
Commodity	Total	Intraport	Receipts	Shipments	Through
Other Chemicals and Related Products	188,836	0	176,549	12,287	0
Fertilizers	92,758	0	92,758	0	0
Petroleum Pitches, Coke, Asphalt, Naptha and Solvents	18,823	0	18,823	0	0
Unknown or Not Elsewhere Classified	2,261	0	1,855	406	0
All Manufactured Equipment, Machinery and Products	2,135	0	0	2,135	0
Other Agricultural Products; Food and Kindred Products	246	0	0	246	0
Forest Products, Lumber, Logs, Woodchips	43	0	0	43	0
Primary Non-Ferrous Metal Products;Fabricated Metal Prods.	21	0	0	21	0
All Commodities	305,123	0	289,985	15,138	0

	Domestic				
Commodity	Total	Intraport	Receipts	Shipments	Through
Other Chemicals and Related Products	155,481	0	143,214	12,267	0
Fertilizers	68,462	0	68,462	0	0
Petroleum Pitches, Coke, Asphalt, Naptha and Solvents	18,823	0	18,823	0	0
Unknown or Not Elsewhere Classified	0	0	0	0	0

All Manufactured Equipment, Machinery and Products	0	0	0	0	0
Other Agricultural Products; Food and Kindred Products	0	0	0	0	0
Forest Products, Lumber, Logs, Woodchips	0	0	0	0	0
Primary Non-Ferrous Metal Products;Fabricated Metal Prods.	0	0	0	0	0
All Commodities	242,766	0	230,499	12,267	0

		Foreign			
Commodity	Total	Intraport	Receipts	Shipments	Through
Other Chemicals and Related Products	33,355	0	33,335	20	0
Fertilizers	24,296	0	24,296	0	0
Petroleum Pitches, Coke, Asphalt, Naptha and Solvents	0	0	0	0	0
Unknown or Not Elsewhere Classified	2,261	0	1,855	406	0
All Manufactured Equipment, Machinery and Products	2,135	0	0	2,135	0
Other Agricultural Products; Food and Kindred Products	246	0	0	246	0
Forest Products, Lumber, Logs, Woodchips	43	0	0	43	0
Primary Non-Ferrous Metal Products;Fabricated Metal Prods.	21	0	0	21	0
All Commodities	62,357	0	59,486	2,871	0

Source
http://cwbi-ndc-nav.s3-website-us-east-1.amazonaws.com/files/wcsc/webpub/#/report-landing/year/2019/region/1/location/844

EXHIBIT H
OUTREACH EFFORTS

Broad outreach requesting information, feedback and comments from the public was conducted between June 28th and July 26th, 2021. Waterway users and interested citizens were asked to complete a survey or provide written comments directly to the City of Wilmington. This public outreach opportunity was publicized via press releases, press reports, television, newspaper advertisement, social media applications, flyers, mailers, direct telephone calls, direct email communications and was also advertised during government meetings open to the public. Additional or specific information regarding outreach efforts can be made available upon request.

Agency & Government Consultations

United States Coast Guard – Fifth District Bridge Office
United States Coast Guard – Waterways Management Division for North Carolina Sector
United State Army Corp of Engineers – Operations Division
MarineCadastre.gov (Bureau of Ocean Management / National Oceanic and Atmospheric Administration)
National Oceanic and Atmospheric Administration
North Carolina Department of Transportation – Division 3
Military Ocean Terminal – Sunny Point, Fire and Emergency Services
University of North Carolina Wilmington
New Hanover County

- Sheriff's Office
- Fire Captain
- Emergency Management

City of Wilmington

- Parks & Recreation
- Police Department
- Fire Department

Direct Stakeholder Outreach

Cape Fear River Pilots Association
Cape Fear Boat Works
Specialty Boatworks

U.S. Department of Homeland Security

United States Coast Guard

Commander
United States Coast Guard
Fifth Coast Guard District

431 Crawford Street
Portsmouth, VA 23704-5004
Staff Symbol: dpb
Phone: (757) 398-6422
Fax: (757) 398-6334
Email: Crystal.k.tucker@uscg.mil
CGDFiveBridges@uscg.mil

16591
04 APR 2022

Mr. Aubrey Parsley, PE
Director of Rail Realignment
305 Chestnut Street
P.O. Box 1810
Wilmington, NC 28402

Dear Mr. Parsley:

The Coast Guard has reviewed the Navigation Impact Report dated September 24, 2021, for the Cape Fear River in Wilmington, NC. Based on a preliminary review of this study and the information available as of the date of this letter, the Coast Guard does not foresee anything that would prevent a bridge permit from being issued. The Preliminary Navigation Clearance Determination (PNCD) and information below are provided to assist the City of Wilmington in preparing and submitting a bridge permit application.

The Coast Guard has made a PNCD that two moveable type bridges that carries freight rail across the Cape Fear River, at mile 26.8, and one between mile 30.2 and mile 30.3, will provide for the current and prospective reasonable needs of navigation. The first proposed moveable type bridge at mile 26.8, should provide at least 135 feet of vertical clearance above mean high water in the open position and at least 250 feet of horizontal clearance through the main navigation span of the bridge. The second proposed moveable type bridge between mile 30.2 and mile 30.3, should provide unlimited clearance vertical clearance above mean high water or ordinary high water in the open position and at least 102 feet of horizontal clearance through the main navigation span of the bridge.

Please note that this PNCD is not binding, does not constitute an approval or final agency action, and **expires three (3) years from the date of this correspondence**. A final determination can only be made in accordance with regulation and after City of Wilmington submits a complete bridge permit application to the Coast Guard. If a complete bridge permit application is not submitted within three (3) years from the date of this correspondence, an updated Navigation Impact Report as described in appendix A of the Coast Guard's Bridge Permit Application Guide, COMDTPUB P16591.3D, should be prepared and submitted in order to obtain a new PNCD.

16591
04 APR 2022

Ms. Crystal K. Tucker, at the above listed address or telephone number, has been assigned as the Coast Guard's Bridge Permit project officer. Please maintain frequent and regular contact with the project officer to ensure efficient and effective project administration.

Sincerely,

PITTS.HAL.R.1121267272 Digitally signed by PITTS.HAL.R.1121267272 Date: 2022.04.04 15:19:07 -04'00'

HAL R. PITTS
Bridge Program Manager
By direction

Encl: Bridge Permit Application Guide, COMDTPUB P16195.3D and BPAG Applicant Template located at (https://go.usa.gov/xRFk2)

Copy: Coast Guard Sector North Carolina, Waterways Management
Federal Railroad Administration, Washington D.C. Regional Office
U. S. Army Corps of Engineers, Wilmington District Office

APPENDIX F: SECTION 7 CORRESPONDENCE

U.S. Department
of Transportation

Federal Railroad

Administration

1200 New Jersey Avenue, SE
Washington, DC 20590

June 2, 2022

Fritz Rohde
National Marine Fisheries Service
Southeast Regional Office
Beaufort Field Office
101 Pivers Island Road
Beaufort, NC 28516-9722

Re: Wilmington Rail Realignment

Greetings Mr. Rohde,

The Federal Railroad Administration (FAA) as the lead Federal Agency, in coordination with the City of Wilmington (City), has initiated an Environmental Assessment (EA) for a proposed new freight rail route to bypass the existing route between Navassa (Davis Yard) and the Port of Wilmington. The project, referred to as the Wilmington Rail Realignment, proposes to reroute the existing freight traffic from the CSXT Beltline in the City of Wilmington to a new westward freight line across the Cape Fear River (CFR) and Eagles Island in New Hanover and Brunswick Counties. The FRA is requesting consultation with the National Marine Fisheries Service (NMFS) under the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA). Per your request during the FRA-NMFS interagency coordination call on 21 January 2022, the FRA is submitting an Essential Fish Habitat (EFH) Assessment that addresses the effects of the proposed action on EFH and federally managed species.

A separate letter is being submitted to Mr. Andrew Herndon to request coordination under Section 7 of the Endangered Species Act (ESA).

If you have questions or requests for additional information, please contact Kevin Wright at 202-868-2628 or kevin.wright@dot.gov.

Sincerely,

Brandon Bratcher
Supervisory Environmental Protection Specialist

Attachments (1)
Wilmington Rail Realignment Essential Fish Habitat Assessment

Cc: Aubrey Parsley, City of Wilmington
Andrew Herndon, National Marine Fisheries Service
Mickey Sugg, US Army Corps of Engineers

ATTACHMENT A

WILMINGTON RAIL REALIGNMENT
ESSENTIAL FISH HABITAT ASSESSMENT

Wilmington Rail Realignment
New Hanover and Brunswick Counties, NC

Essential Fish Habitat Assessment

February 2022

Prepared for:

AECOM

Prepared by:

Dial Cordy and Associates Inc.
201 N. Front St., Suite 307
Wilmington, North Carolina 28401

TABLE OF CONTENTS

APPENDICES

LIST OF TABLES

LIST OF FIGURES

1.0 INTRODUCTION

In accordance with the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), as amended by the Sustainable Fisheries Act of 1996, this Essential Fish Habitat (EFH) Assessment has been prepared to address the potential effects of the proposed Wilmington Rail Realignment Project on EFH and federally managed fisheries. The proposed action would reroute existing freight traffic from the CSXT Beltline in the City of Wilmington to a new westward freight line across the Cape Fear River (CFR) and Eagle Island. The purpose of the proposed action is to improve safety and regional transportation mobility by reducing the number of at-grade railroad crossings.

2.0 PROPOSED ACTION

The proposed action would construct a new four-mile single-track rail line between Greenfield Street in downtown Wilmington and the existing CSXT line on the west side of the Northeast Cape Fear River (NECFR) above Eagle Island (Figure 1). From Greenfield Street the proposed alignment extends north along South Front Street through downtown Wilmington before turning west and crossing the CFR to Eagle Island just below the existing Cape Fear Memorial Bridge. The alignment continues west on Eagle Island; eventually turning north and crossing US HWY 76/74. From US 76/74 the alignment continues north on Eagle Island and crosses the CFR a second time just above its confluence with the NECFR. After crossing the river, the alignment continues northward along the west side of US HWY 421 to the project terminus at the existing CSXT rail line. The proposed project is currently in the 30 percent preliminary engineering design phase, which is principally concerned with defining the project alignment and profile (Appendix A). The structural design of the project is evaluated at a conceptual level in this assessment. Detailed design plans for specific structural elements will be developed during a later phase of engineering design.

The preliminary project design encompasses above-grade and at-grade rail components; including an at-grade railway trackbed from Greenfield Street to the CFR, a lift span bridge for the lower CFR crossing, a pier-supported elevated rail across Eagle Island, a bascule bridge for the upper CFR crossing, and an at-grade railway trackbed from the upper CFR crossing to the existing CSXT line. The proposed lift span bridge for the lower CFR crossing would be similar to the existing Cape Fear Memorial Bridge, whereas the proposed bascule bridge for the upper CFR crossing would be similar to the existing CSXT Hilton Railroad Bridge across the NECFR. It is anticipated that the movable spans of both bridges would be supported at either end by cast in place concrete foundational structures, whereas the bridge approach spans would be supported by concrete piers on a foundational system of pre-cast or drilled shaft concrete piles with a water line concrete pile cap to resist vessel collisions. The ~1.5-mile elevated rail across Eagle Island would be supported by piers on a foundational system of driven or drilled shaft concrete piles and/or pile-supported concrete footings. Figure 2 depicts various pier configurations that could potentially be used to construct the bridge approach spans and elevated rail. Span lengths will be determined during a later phase of engineering design: however, 60-ft span lengths for curves and 90-ft lengths for straight rail spans are considered conservative estimates of span lengths and pier spacing along the alignment.

Figure 1. Proposed project alignment.

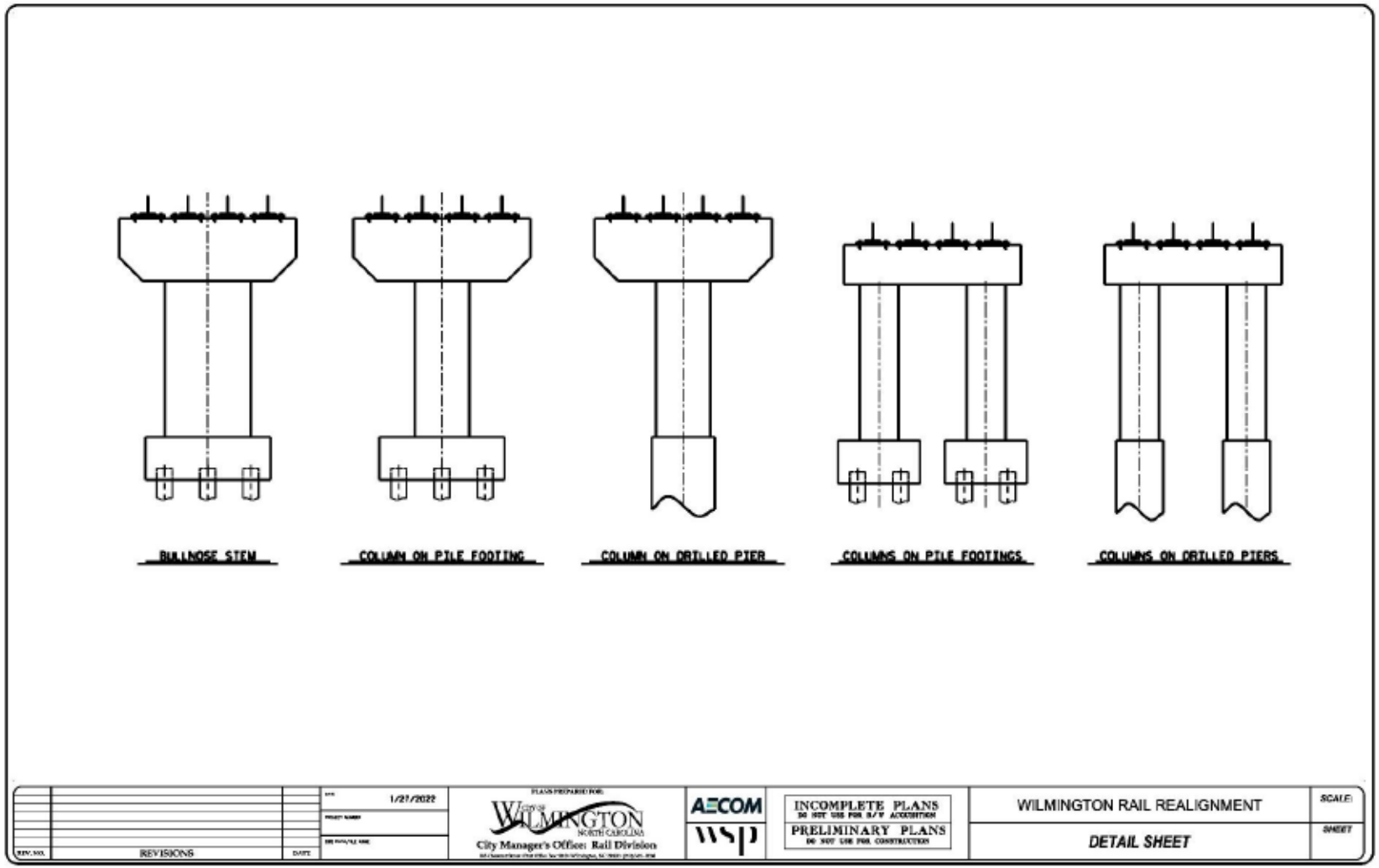


Figure 2. Potential pier and pile configurations for elevated rail segments.

Although specific construction methods would be identified during a later phase of engineering design, this assessment considers construction methods and equipment that are typically employed by similar in-water projects. Conventional construction methods utilizing barges, cranes, and timber mats are anticipated. As indicated above, elevated rail segments would be supported by piers on foundational systems of pre-cast and/or drilled shaft concrete piles. In the case of pre-cast concrete piles, it is assumed that installation in the river bed or wetland substrate would be accomplished by vibratory and/or impact pile drivers. - In the case of drilled shaft piles, construction typically involves pre-drilling a pile shaft, installing a temporary or permanent steel casing to keep the shaft open, inserting a rebar cage, and filling the shaft with liquid concrete. Steel casings are typically installed with a vibratory pile driver, which may also be required for the removal of temporary steel casings. Access to the construction site would likely occur via Battleship Road, US 17/74/76, and US 74/421. Access to the river sections will likely occur from the project right of way along both sides of the river. The USACE Engineer Repair Yard along the west side of the lower CFR crossing could potentially be used for materials storage, staging, and access.

3.0 DESCRIPTION OF THE ACTION AREA

The action area considered in this assessment is the tidally influenced CFR Estuary (CFRE) between downtown Wilmington and Navassa in New Hanover and Brunswick Counties, NC. The action area estuarine environment is comprised of the mainstem CFR and Brunswick River channels and their associated tidal floodplains. The CFRE is strongly affected by lunar semidiurnal ocean tides that propagate ~60 miles up the mainstem CFR to Lock and Dam #1 in Bladen County. Mean tidal range increases from ~4.3 ft at the river mouth to a maximum of ~5.1 ft at downtown Wilmington, and declines in the estuary above to a low of ~1.0 ft at Lock and Dam #1. Salinity levels and the position of the saltwater-freshwater boundary in the estuary are heavily influenced by variability in tidal conditions and freshwater inflow (Becker 2006, Leonard et al. 2011). Average surface salinity conditions, which determine the composition of tidal wetland communities in the estuary, are generally considered to be oligohaline (5.0 - 0.5 ppt) in the vicinity of the action area. However, during the summer and fall (July-Nov), maximum monthly surface salinities at the upper end of Eagle Island generally range from 15 to 25 ppt (Leonard et al. 2011). Tidal marshes in the action area are strongly dominated by dense, often monospecific stands of narrow-leaved cattail (*Typha angustifolia*) and common reed (*Phragmites australis*). Additional common marsh constituents include big cordgrass (*Spartina cynosuroides*), soft-stem bulrush (*Schoenoplectus tabernaemontani*), and salt-marsh bulrush (*Bolboschoenus robustus*).

4.0 MANAGED FISHERIES AND EFH/HAPC IN THE ACTION AREA

The action area encompasses estuarine habitats that are designated as EFH and/or Habitat Areas of Particular Concern (HAPCs) in Fishery Management Plans (FMPs) developed by the South Atlantic Fisheries Management Council (SAFMC) and Mid-Atlantic Fishery Management Council (MAFMC) (Table 1). The MSFCMA defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." HAPCs comprise a more specific subset of EFH that are considered to be especially critical due to factors such as rarity, susceptibility to human-induced degradation, and/or high ecological importance. Federally managed species and associated EFH/HAPCs that occur in the vicinity of the action area are described in the sections below.

Table 1. Federally managed species and EFH/HAPC in the vicinity of the action area.

SPECIES/GROUP	EFH/HAPC
SAFMC EFH	
Penaeid Shrimp	Tidal Estuarine Emergent Wetlands Submerged Aquatic Vegetation Subtidal/Intertidal Non-vegetated Flats
Snapper-Grouper	Tidal Estuarine Emergent Wetlands Tidal Creeks Submerged Aquatic Vegetation Unconsolidated Bottom
Coastal Migratory Pelagics	Primary Nursery Areas
SAFMC HAPC	
Penaeid Shrimp	Primary Nursery Areas
Snapper-Grouper	Primary Nursery Areas Submerged Aquatic Vegetation
MAFMC EFH	
Summer Flounder	Estuaries with salinities >0.5 ppt
Bluefish	Estuaries
Atlantic Butterfish	Inshore pelagic habitats
MAFMC HAPC	
Summer Flounder	Submerged Aquatic Vegetation

4.1 EFH and HAPCs

4.1.1 Estuarine Emergent Wetlands

Tidal marshes throughout the action area are strongly dominated by narrow-leaved cattail and common reed, which often form dense monospecific stands across large expanses of the tidal floodplain. Cattail dominates the lower portions of the tidal floodplain; whereas common reed has a relatively low tolerance to salinity and is generally restricted to higher areas on dredged material deposits. The majority of the tidal floodplain between the Eagle Island Confined Disposal Facility and US 17/76/74 is covered by a continuous layer of historically placed dredged material that has filled in the former Alligator Creek channel and increased the elevation of the floodplain. The area remains tidally influenced, but the increase in elevation has resulted in the establishment of a nearly continuous monospecific common reed marsh between Battleship Road and the US 17/76/74 interchange. Additional plant species that are common constituents of tidal marshes in the action area include big cordgrass, soft-stem bulrush, and salt-marsh bulrush.

4.1.2 Unconsolidated Bottom

Intertidal and shallow subtidal unconsolidated bottom habitats provide abundant food resources for estuarine-dependent juveniles in an environment that is relatively inaccessible to large predators via shallow depths (SAFMC 1998). Shallow unconsolidated bottom habitats support highly productive benthic microalgal communities. Benthic microagal primary production, along with imported primary production in the form of phytoplankton and detritus, supports highly productive benthic infaunal invertebrate communities that comprise the prey base for most estuarine-dependent demersal fishes; including summer flounder and estuarine-dependent species of the snapper-grouper complex. Penaeid shrimp are most abundant in shallow unconsolidated bottom habitats at the highly productive shallow bottom-marsh interface.

4.1.3 Primary Nursery Areas

Primary Nursery Areas (PNAs) are defined as "those areas in the estuarine system where initial post-larval development takes place" [15 North Carolina Administrative Code (NCAC) 3I .0101(b)(20)(E)]. PNAs support uniform populations of very early juveniles and are typically located in the upper reaches of the estuarine system. Designated PNAs in the action area generally encompass the waters of the CFR along the margins of the authorized navigation channels and the contiguous fringing tidal marshes along the shorelines (Figure 2). The CFRE is an important nursery area for estuarine-dependent fish and invertebrate species that spawn offshore and use estuarine habitats for juvenile development. Ocean-spawned larvae are transported shoreward by the prevailing currents and eventually pass through tidal inlets and settle in estuarine nursery habitats. For most estuarine-dependent species, larval settlement occurs in the uppermost reaches of shallow tidal creek systems (Weinstein 1979, Ross and Epperly 1985). Juveniles remain in the estuarine nursery areas for one or more years before moving offshore and joining the adult spawning stock (NCDEQ 2016). Studies of nursery habitat utilization in the CFRE indicate that densities of estuarine-dependent juveniles in the upper oligohaline marshes and creeks equal or exceed densities in the mesohaline to polyhaline creeks and salt marshes of the mid to lower estuary (Rozas and Hackney 1984, Ross 2003). Rozas and Hackney (1984) reported three seasonal peaks in numerical abundance in oligohaline marsh rivulets during the spring, summer, and fall.

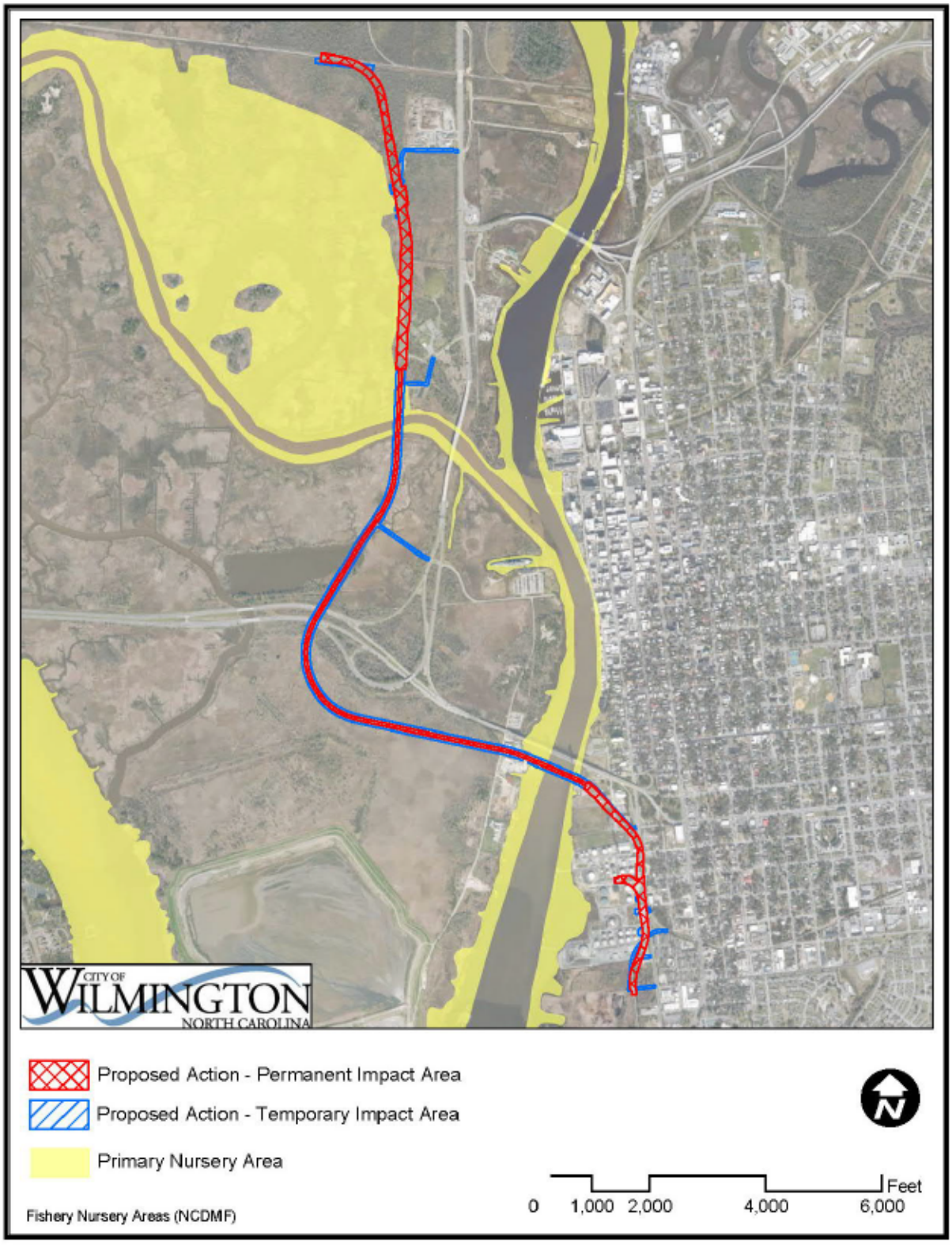


Figure 3. Designated PNAs in the vicinity of the action area

4.1.4 Submerged Aquatic Vegetation

Submerged Aquatic Vegetation (SAV) in NC estuaries encompasses 14 taxa of bed-forming rooted aquatic vascular plants (NCDEQ 2016). SAV beds occur on subtidal and occasionally intertidal sediments in sheltered estuarine waters. Environmental requirements include unconsolidated sediments for root and rhizome development, adequate light reaching the bottom, and moderate to negligible current velocities (Thayer et al. 1984, Ferguson and Wood 1994). SAV beds provide important structural fish habitat and perform important ecological functions such as primary production, sediment and shoreline stabilization, and nutrient cycling (NCDEQ 2016). SAV habitats are important nursery areas for the juveniles of estuarine-dependent species; including federally managed species such as black sea bass, bluefish, summer flounder, gag, and penaeid shrimp. NCDMF has generally concluded that SAV beds are absent from the CFRE, but has confirmed the presence of SAV beds that were recently discovered along Eagle Island in the Brunswick River (Personal communication, Ann Deaton, NCDMF Habitat Protection and Enhancement Section, 19 Feb 2019). SAV beds consisting of slender naiad (*Najas gracillima*), a species of tidal freshwater to oligohaline habitats (Brush and Hilgartner 2000), occur approximately one mile west of the proposed alignment on shallow subtidal flats in the Brunswick River just below the US HWY 17/74/76 Bridge. Protected shallow subtidal flats that would support SAV establishment do not occur in the CFR at the proposed rail crossings.

4.2 Federally Managed Species

4.2.1 Penaeid Shrimp

Federally managed penaeid shrimp in North Carolina include brown shrimp (*Farfantepenaeus aztecus*), pink shrimp (*F. duorarum*), and white shrimp (*Litopenaeus setiferus*). Adults spawn offshore in high salinity oceanic waters during the winter or spring, and the ocean-spawned larvae and post-larvae are transported by currents to inshore estuarine nursery habitats where they maintain a benthic existence (SAFMC 1981). Larval and post-larval estuarine recruitment periods vary among the three species (Table 2). Penaeid shrimp tolerate a wide range of salinities (Table 2), and are most abundant in shallow mud-silt habitats where they congregate at the highly productive marsh-water interface. As their size increases, shrimp move toward higher-salinity ocean waters, eventually migrating offshore in the fall. The action area encompasses habitats that are designated as EFH and HAPCs for all life stages of penaeid shrimp; including estuarine tidal marshes, subtidal and intertidal non-vegetated flats, submerged aquatic vegetation (SAV), and state designated Primary Nursery Areas (PNAs).

Table 2. Penaeid shrimp salinity requirements and recruitment periods (NCDMF 2016).

Species	Salinity (ppt)	Juvenile Recruitment
Brown Shrimp	2-35	February - March
Pink Shrimp	0-35	June - October
White Shrimp	2-35	April - May

4.2.2 Snapper-Grouper Complex

The snapper-grouper complex is an assemblage of 59 species that share a common association with hardbottom or reef habitats during part of their life cycle. Snappers (Lutjanidae), groupers (Serranidae), porgies (Sparidae), and grunts (Haemulidae) generally inhabit offshore reef and hardbottom habitats; whereas, nearshore ocean hardbottoms along the NC coast have cooler temperatures and a fish community dominated primarily by black sea bass (*Centropristis striata*), scup (*Stenotomus chrysops*), and associated temperate species (Sedberry and Van Dolah 1984). Most snapper-grouper species are associated with offshore reef and hardbottom habitats throughout their life cycle; however, a few species such as gag (*Mycteroperca microlepis*), gray snapper (*Lutjanus griseus*), and lane snapper (*L. synagris*) use estuarine nursery habitats for juvenile development (SAFMC 1998, NCDMF 2006). Juveniles of these estuarine-dependent species emigrate from the estuary to nearshore hardbottom habitats in the fall, and eventually move to offshore reef and hardbottom habitats. The action area encompasses habitats that are designated as EFH and HAPCs for the juvenile life stages of estuarine-dependent snapper-grouper species; including estuarine tidal marsh, tidal creeks, unconsolidated bottom, SAV, and PNAs. Studies of fish community structure in nursery habitats of the CFRE (Weinstein 1979, 1980) indicate that habitat utilization by snapper-grouper species such as gag and lane snapper is restricted to the lower high salinity estuary near the river mouth. The results of these studies suggest that the action area salinity regime would be unlikely to support sustained habitat utilization by estuarine dependent snapper-grouper species. The potential for habitat utilization in the action area is likely limited to short-term high salinity events during periods of extremely low river discharge.

4.2.3 Coastal Migratory Pelagics

The coastal migratory pelagics management unit includes Spanish mackerel (*Scomberomorus. maculates*), king mackerel (S. *cavalla*), and cobia (*Rachycentron canadum*). Adult Spanish mackerel spawn in groups over the inner continental shelf, beginning in April off the Carolinas. Larvae are most commonly found in nearshore ocean waters at shallow depths less than 30 ft. Most juveniles remain in nearshore ocean waters, but some use high salinity estuaries as nursery habitats. Adult Spanish mackerel spend most of their lives in the open ocean but are also found in tidal estuaries and coastal waters (ASMFC 2011a, 2011b, Mercer et al. 1990). King mackerel are primarily a coastal species, with smaller individuals of similar size forming schools over reefs and areas of bottom relief, and larger solitary individuals preferring anthropogenic structures and wrecks. Cobia are found over the continental shelf and in high salinity estuarine waters; preferring waters in the vicinity of reefs and artificial structures such as pilings and buoys. Spawning along NC occurs primarily in offshore ocean waters during May and June; however, spawning has also been observed in estuaries and shallow bays, with the young moving offshore soon after hatching (SAFMC 1983 and 2011). Designated EFH for coastal migratory pelagics in the action area includes PNAs. However, the preference of coastal migratory pelagics for high salinity estuarine waters suggests that sustained utilization of PNAs in the action area would be unlikely. The potential for habitat utilization in the action area is likely limited to high salinity events during periods of low river discharge.

4.2.4 Bluefish

The bluefish is a migratory, pelagic species found in temperate and semi-tropical continental shelf waters around the world with the exception of the north and central Pacific. In North America, bluefish range from Nova Scotia to Florida in the Atlantic Ocean and from Florida to Texas in the

Gulf of Mexico. Spawning in the South Atlantic Bight occurs near the shoreward edge of the Gulf Stream primarily during April and May. Larval development occurs in the upper water column over the outer continental shelf, with transitional pelagic juveniles eventually moving to nearshore ocean and estuarine waters that serve as the principal nursery habitats for juvenile development (Kendall and Walford 1979). Estuarine juveniles are most commonly associated with sandy unconsolidated bottom habitats; but also use mud/silt bottom, SAV, marine macroalgae, oyster reefs, and tidal marshes (Shepherd and Packer 2006). Juveniles are common in high salinity estuaries along the southern NC coast during summer and fall, where they are usually associated with salinities of 23 to 33 ppt; however, juveniles are found at salinities as low as 3 ppt (Fahay et al. 1999). Designated inshore EFH for juvenile and adult bluefish along the southern NC coast includes all estuaries below MHW.

4.2.5 Summer Flounder

The geographic range of the summer flounder includes shallow estuaries and outer continental shelf waters along the Atlantic Coast from Nova Scotia to Florida (Packer et al. 1999). Adult summer flounder exhibit strong seasonal inshore-offshore movements; concentrating in estuaries and sounds from late spring through early fall before migrating offshore to the outer continental shelf where spawning occurs during the fall and early winter. Larvae and post larvae recruit to estuarine nursery habitats from October to May and eventually settle to the bottom and bury into the sediment where development to the juvenile life stage is completed. Late larval and juvenile flounder actively prey on crustaceans, copepods, and polychaetes (NEFSC 1999). Juveniles prefer sandy shell substrates; but also inhabit marsh creeks, mud flats, and seagrass beds. Juveniles often remain in North Carolina estuaries for 18 to 20 months. Adults prefer sandy substrates, but also use seagrass beds, tidal marsh creeks, and sand flats (ASFMC 2011c and d, NEFSC 1999). The action area encompasses habitats that are designated as EFH and HAPCs for larval, juvenile, and adult summer flounder; including estuarine waters with salinities >0.5 ppt, tidal marsh, and SAV.

4.2.6 Atlantic Butterfish

Butterfish are pelagic fishes that form loose schools near the surface and feed mainly on planktonic prey. Butterfish winter on the outer continental shelf in the Middle Atlantic Bight and migrate inshore in the spring. During the summer, butterfish are widely distributed over the Mid-Atlantic shelf from estuaries out to depths of ~200 meters. Juvenile and adult butterfish are common to abundant in the high salinity and mixing zones of estuaries from Massachusetts Bay to the mid-Atlantic. In late fall, butterfish move southward and offshore in response to falling water temperatures (Cross et al. 1999). EFH for adult Atlantic butterfish includes pelagic inshore and offshore waters of the South Atlantic Bight, including the CFRE, where bottom depths are between 30 and 750 feet and salinities are >5 ppt.

5.0 EFFECTS ON EFH/HAPC AND MANAGED SPECIES

5.1 Assessment Approach

As previously described, the current phase of preliminary engineering design is principally concerned with defining the project alignment and profile. The current level of engineering design does not provide detailed designs or construction methods for specific structural elements. For purposes of this assessment, the project's physical disturbance footprint is defined by permanent and temporary impact corridors centered on the proposed rail alignment. For bridges and elevated rail segments, the total combined width of the permanent and temporary impact areas is 150 feet; including a 50-ft-wide permanent impact corridor centered on the proposed rail alignment and 50-ft-wide temporary impact corridors along both sides of the permanent impact corridor. The permanent impact area for filled rail bed segments is a 140- to 210-ft-wide corridor centered on the proposed rail alignment. No temporary impact corridors are associated with the filled rail bed segments, as work would occur from the rail bed as it is constructed. Additional temporary impact areas include small staging areas and access roads. The permanent impact corridor widths are sufficient to encompass potential structures (e.g., spans, piles, piers, track) and fill placement areas, whereas the temporary impact corridors encompass the construction limits, staging areas, and access roads. Although the established impact areas encompass the project structural footprint and construction limits, the analyses of potential effects in this assessment are not limited to these areas. The potential effects considered in this assessment include acoustic disturbance, sediment suspension, and other effects that can potentially impact EFH habitats and managed species beyond the established impact areas. The potential construction methods and equipment that are considered in this assessment include those that are likely to be employed based on similar in-water projects. However, specific construction methods will not be determined until a later stage of project development. The effects assessment is presented according to habitat type, with the exception of the estuarine water column that is considered a component of all designated EFH/HAPC habitats. Analyses of acoustic and water quality effects, which propagate through the water column to potentially affect all EFH habitats, are provided as separate stand-along sections.

5.2 Estuarine Emergent Wetlands

The proposed rail alignment crosses tidal marshes on Eagle Island and the mainland above the upper CFR crossing. Permanent direct impacts on tidal marsh would result from construction of the foundational support systems for elevated rail segments on Eagle Island, tidal marsh shading by the elevated rail decks, and fill placement for construction of the at-grade rail segment above the upper CFR crossing (Table 3, Figures 3 and 4). For purposes of this assessment, it is assumed that the combined effects of foundational structure placement and shading would result in the loss of all tidal marsh EFH habitat and/or habitat function within the 50-ft-wide elevated rail permanent impact area. Tidal marsh shading effects are heavily influenced by bridge height and width, with adverse effects on tidal marsh plant and benthic communities generally occurring at bridge height-to-width ratios of less than 0.7 (Broome et al. 2005). At the standard single track rail bridge width of 16.5 feet, rail deck heights of less than 11.5 feet would result in height-to-width ratios <0.7. Proposed rail deck heights of less than 11.5 feet that would potentially result in adverse shading effects on underlying tidal marshes are limited to short spans on either side of the upper CFR crossing. For the at-grade rail segment, it is assumed that fill placement and grading to construct the trackbed would result in the loss of all tidal marsh EFH habitat within the permanent impact area.

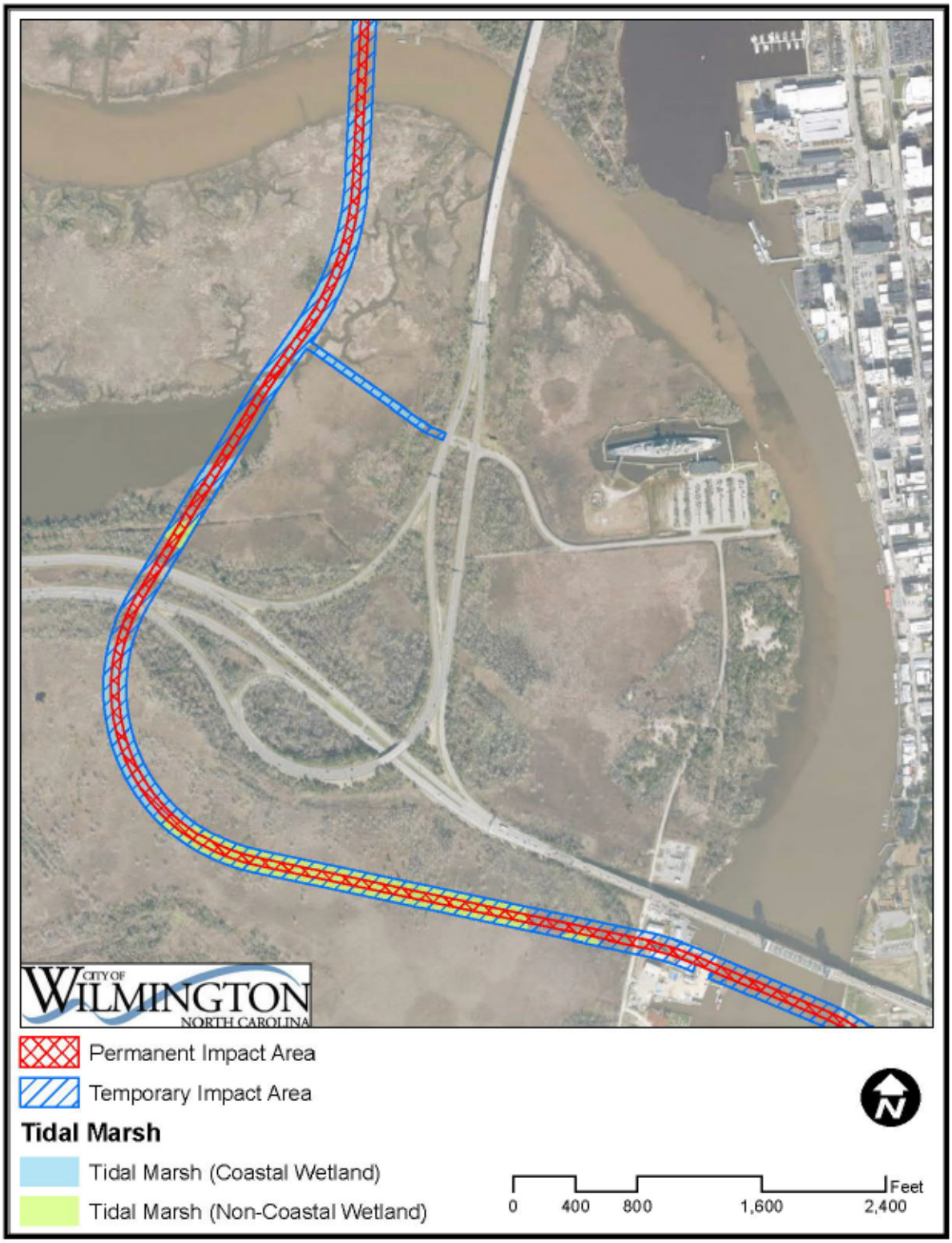


Figure 4. Permanent and temporary tidal marsh impacts on Eagle Island.

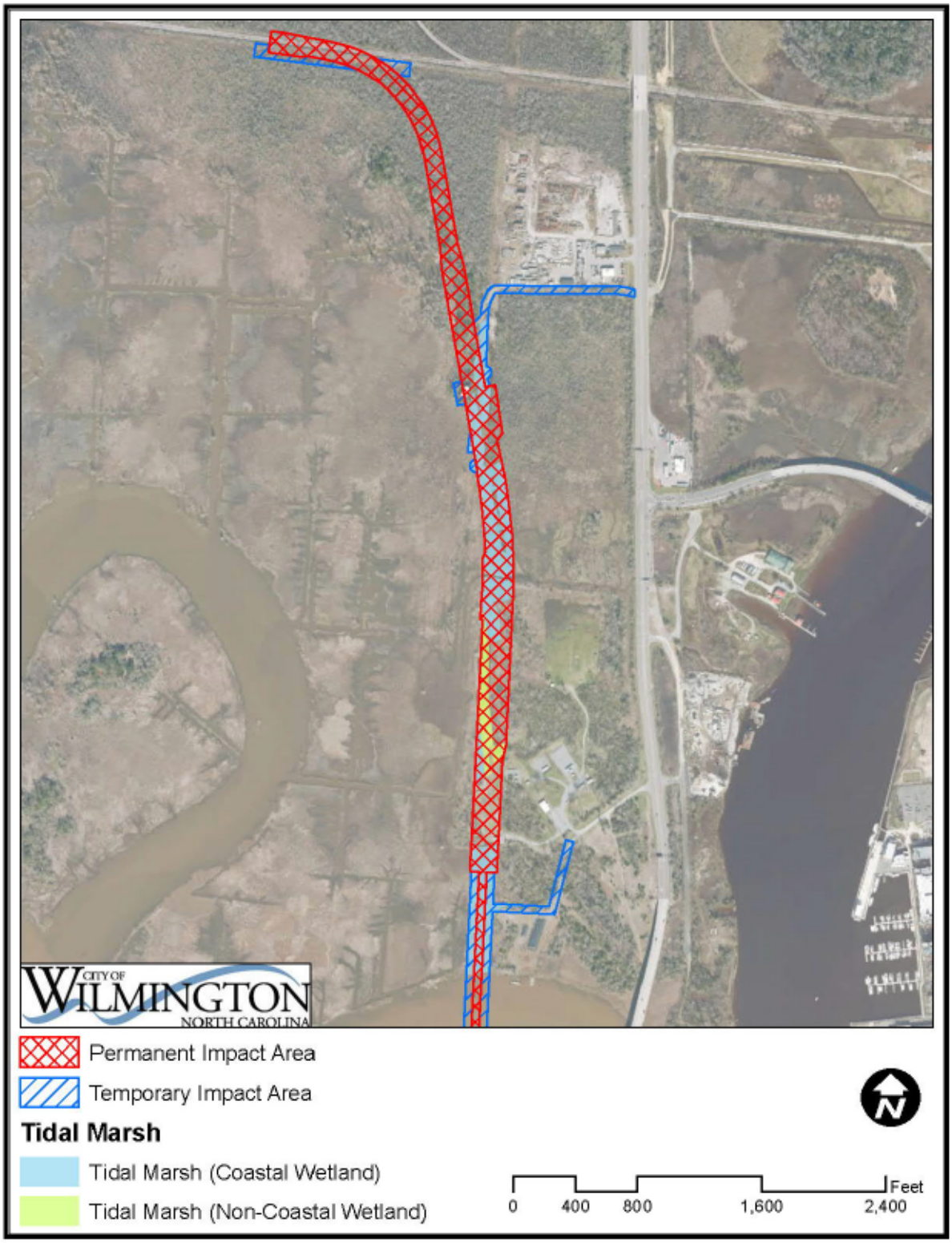


Figure 5. Permanent and temporary tidal marsh impacts between the upper CFR crossing and existing CSXT line.

Table 3. Permanent and temporary impacts on tidal marsh.

	Permanent Impact Area (ac)	Temporary Impact Area (ac)	Total
Tidal Marsh (Coastal Wetland)	10.80	10.88	21.68
Tidal Marsh (Non-Coastal Wetland)	4.44	6.11	10.55
Total	**15.24**	**16.99**	**32.23**

Construction of the linear project across the tidal floodplain would have the potential for additional permanent direct impacts on tidal marsh EFH habitats through tidal restriction; including the restriction of tidal sheet flow across the floodplain and/or the restriction of tidal flow in creek channels at the rail crossings. Although the current level of engineering design does not allow for a detailed assessment of potential effects on tidal hydrology, the remaining tidal floodplain areas between the elevated rail support systems would be returned to grade, thus avoiding potential effects on tidal sheet flow across the floodplain on Eagle Island. Furthermore, it is assumed that the tidal creek channel and associated thalweg through the borrow pond would be spanned in a manner that would maintain the existing hydrological regime. The proposed at-grade rail segment above Eagle Island runs north along the disturbed outer (eastern) margin of the active CFR tidal floodplain. The areas along the east side of alignment consist predominantly of diked and filled areas of development and non-tidal or supratidal swamp forest. An exception is the proposed at-grade tidal creek culvert crossing ~0.5 mile above the upper CFR crossing, where extensive tidal marsh areas are associated with the tidal creek on the east side of the alignment. Based on the preliminary design, the rail crossing would employ a double concrete box culvert of sufficient size and design to provide for unrestricted tidal flow between the CFR and the creek's tidal marsh system along the east side of the alignment.

Temporary direct impacts on tidal marsh would result from timber mat placement, heavy machinery operations, and the staging of equipment and materials. Direct impacts on tidal marsh EFH within the temporary impact areas would include the loss of tidal marsh plant and benthic invertebrate communities and soil disturbance and compaction. It is assumed that the temporary impact areas would be regraded and/or replanted as necessary to return the areas to pre-construction conditions.

Effects on Managed Species

Utilization of the affected tidal marshes is predominantly by the juvenile life stages of managed species. Estuarine-dependent juveniles would be adversely affected by permanent and temporary reductions in marsh primary production and the availability of tidal marsh foraging and refuge habitats. The magnitude of effects on managed species would depend on the capacity of equivalent habitats in the area to support additional estuarine-dependent juveniles.

5.3 Unconsolidated Bottom

Permanent and temporary direct impacts on unconsolidated bottom EFH habitats would result from the construction of bridges across the CFR, elevated rail construction across an unnamed tributary of Redmond Creek on Eagle Island, and filled rail bed construction across an unnamed tributary of the CFR on the mainland above Eagle Island. The total area of unconsolidated bottom in the established impact areas is 6.9 acres; including 2.4 acres in the permanent impact areas and 4.5 acres in the temporary impact areas. Table 4 provides a breakdown of the permanent and temporary impact acreages that are associated with the individual project components. Permanent direct impacts on unconsolidated bottom in the CFR and the tidal creek on Eagle Island would result from construction of the foundational support systems for bridge and elevated rail structures. Permanent direct impacts on the upper mainland tidal creek would result from the placement of concrete culverts in the creek bed for construction of the at-grade rail trackbed. For purposes of this assessment, it is assumed that the placement of foundational structures and culverts would result in the loss of all unconsolidated bottom EFH habitat and/or EFH habitat function within the permanent impact areas.

Table 4. Permanent and temporary impacts on unconsolidated bottom.

Channel Reach	Permanent Impact Area (ac)	Temporary Impact Area (ac)	Total
Lower CFR Crossing	1.0	2.0	**3.0**
Upper CFR Crossing	0.6	1.1	**1.7**
Eagle Island Tidal Creek Crossing	0.7	1.4	**2.1**
Mainland Tidal Creek Crossing	0.1	0.0	**0.1**
Total	**2.4**	**4.5**	**6.9**

Temporary direct impacts on unconsolidated bottom habitats in the CFR would result from the installation of piles for temporary work platforms and general disruption of the benthic substrate via mechanical disturbance and/or sediment deposition. It is assumed that secondary productivity by benthic infaunal invertebrate communities in the temporary impact areas would be impacted for the duration of the construction process. However, relatively rapid benthic community recovery would be expected upon completion of the project. The recovery of benthic communities from maintenance dredging in the Anchorage Basin and other silty channel reaches of the upper estuary occurs in less than 6 months (Ray 1997). Temporary direct impacts on unconsolidated bottom habitats in the tidal creeks would result from timber mat placement, heavy machinery operations, and general disruption of the benthic substrate via mechanical disturbance and/or sediment deposition. It is assumed that secondary productivity by benthic infaunal invertebrate communities in the temporary impact areas would be impacted for the duration of the construction process. However, relatively rapid benthic community recovery would be expected upon completion of the project. Benthic community recovery periods of <6 months have been reported in shallow silty estuarine navigation channels (Van Dolah et al. 1984, Van Dolah et al. 1979, Stickney and Perlmutter 1975, and Stickney 1972).

Effects on EFH Function and Managed Species

All of the affected unconsolidated bottom habitats currently perform important secondary productivity and benthic foraging habitat functions that would be impacted by the proposed action. Other existing nursery habitat functions such as shallow water refuge and benthic primary productivity are limited to relatively shallow bottom habitats. The functions of unconsolidated bottom habitats as nursery areas for early life stage juveniles are also critically linked to the presence and function of contiguous fringing tidal marshes. Shallow water refuge function in estuarine nursey habitats is generally associated with depths of <6 feet Mean Low Water (MLW) that are inaccessible to large predators. Benthic primary productivity is dependent on water column properties that control the depth of light penetration. Light is strongly attenuated in the CFR estuarine water column by both turbidity and dark organic stained waters that are received from the major blackwater tributaries (Mallin 2013). The magnitude of light attenuation is sufficient to limit phytoplankton productivity, thus indicating that significant benthic primary production is likely limited to relatively shallow depths.

Lower CFR Crossing

The impact areas associated with the lower CFR crossing are largely contained within the Anchorage Basin navigation channel reach. The side slopes of the maintained navigation channel prism extend nearly to the opposing shorelines. Both shorelines are covered by concrete wharfs and/or bulkheads, and fringing tidal marshes are absent. Based on a USACE cross-sectional survey of the uppermost Anchorage Basin (USACE 2018), depths are ≥30 ft across the channel with the possible exception of a narrow zone along the eastern shoreline bulkhead. Thus, the principal impacts of the proposed action on EFH habitat function and managed species would involve permanent and temporary reductions in the availability of foraging habitat and benthic prey resources for later stage juveniles and adults that are not dependent on shallow depths for protection from predation.

Upper CFR Crossing

The river channel at the upper CFR crossing encompasses the Cape Fear River Above Wilmington federal navigation project. Although the navigation channel has not been maintained in many years, strong tidal currents maintain a deep, steep-sided river channel in the vicinity of the proposed rail crossing. The most recent USACE hydrographic survey conducted in 2016 recorded maximum channel depths of approximately -30 to -37 ft MLW in the vicinity of proposed crossing; well in excess of the authorized -25-ft MLW depth. The existing river channel encompasses narrow zones of shallow bottom habitat along the shorelines that are flanked by fringing tidal marshes. Impacts on the shallow bottom habitats would adversely affect managed species through permanent and temporary losses of shallow depth dependent nursery habitat functions; including benthic primary productivity, high secondary benthic productivity, and shallow water refuge. Impacts on unconsolidated bottom in the deeper portions of the channel would affect managed species primarily through permanent and temporary reductions in the availability of foraging habitat and benthic prey resources for later stage juveniles and adults that are not dependent on shallow depths for protection from predation.

Tidal Creeks

The affected unconsolidated bottom habitats in the tidal creek crossings are shallow bottom habitats that are fringed by tidal marshes. Impacts on these habitats would adversely affect managed species through permanent and temporary losses of shallow depth dependent nursery habitat functions; including benthic primary productivity, high secondary benthic productivity, and shallow water refuge.

5.4 Primary Nursery Areas

The proposed rail alignment crosses PNAs at the lower and upper CFR crossings that are designated as EFH and HAPC for managed species (Figures 4 and 5). PNAs at the lower CFR crossing encompass marginal portions of the subtidal river channel along either side of the Anchorage Basin navigation channel reach. PNAs at the upper CFR crossing encompass portions of the river channel along either side of the Cape Fear River Above Wilmington federal navigation channel, as well as contiguous tidal marshes along the north side of the river. Table 5 provides a breakdown of PNA acreages within the permanent and temporary impact areas. Note that the impact quantities in Table 5 were previously included in the impact acreage totals for tidal marsh and unconsolidated bottom. The PNA impacts encompass a subset of the overall tidal marsh and unconsolidated bottom impacts at the CFR crossings. The effects of the proposed action on specific nursery habitat functions were addressed in the preceding stand-alone analyses of tidal marsh and unconsolidated bottom effects.

Table 5. Permanent and Temporary Direct Impacts on PNAs

Location	Permanent Impact (ac)		Temporary Impact (ac)		Total
	CFR	Marsh	CFR	Marsh	
Lower CFR Crossing	0.5	-	1.0	-	**1.5**
Upper CFR Crossing	0.2	1.1	0.4	1.5	**3.2**
Total	**0.7**	**1.1**	**1.4**	**1.5**	**4.7**

Figure 6. Permanent and temporary direct impacts on PNAs at lower CFR crossing.

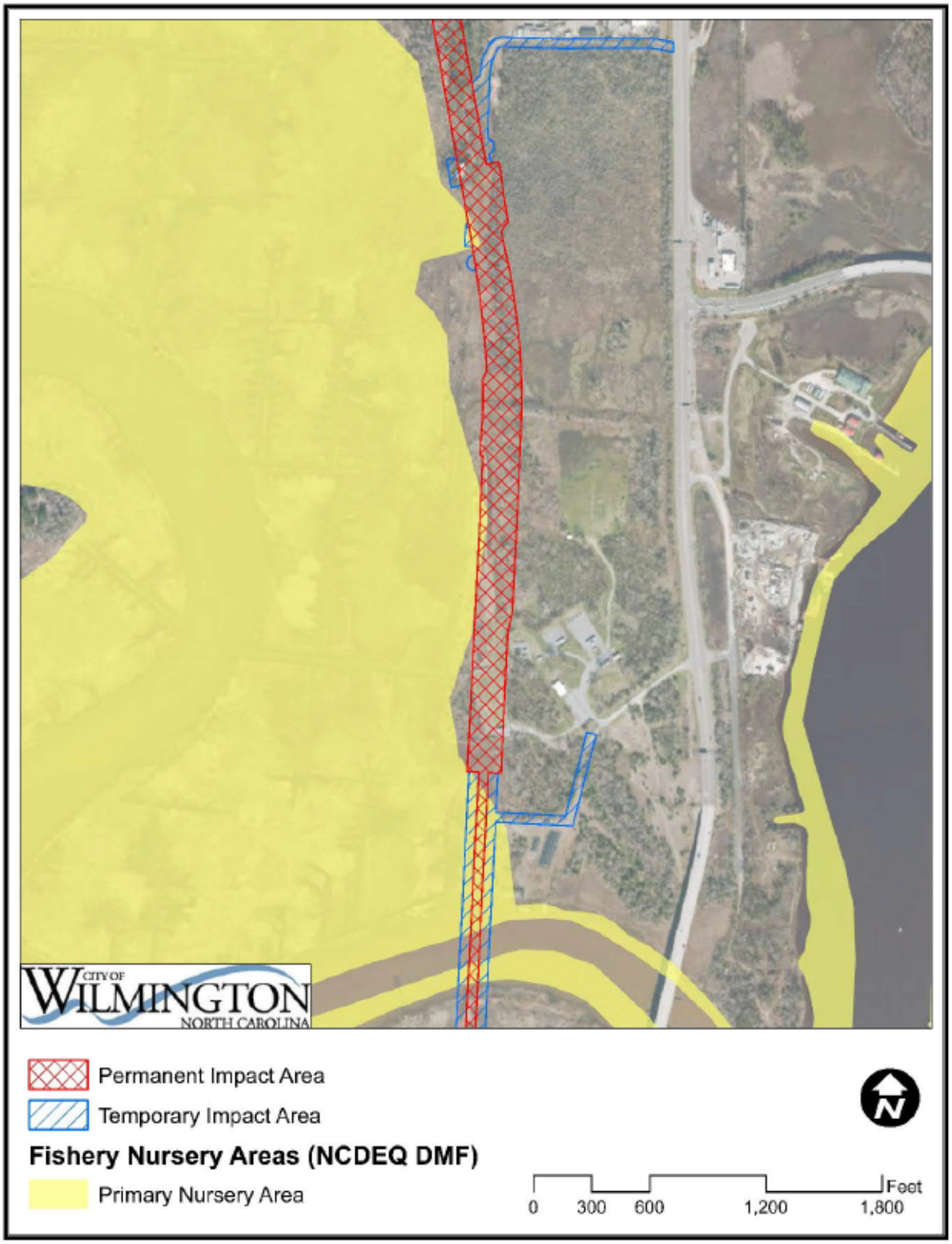


Figure 7. Permanent and temporary direct impacts on PNAs at upper CFR crossing.

5.5 Submerged Aquatic Vegetation

The proposed rail alignment crosses US HWY 17/74/76 approximately one mile east of the Brunswick River channel, and thus is not expected to have any effect on the known SAV beds. Protected shallow subtidal flats that would support SAV establishment do not occur in the CFR at the proposed rail crossings (see Section 5.3), thus the proposed action would not be expected to have any effect on SAV.

5.6 Acoustic Effects

The current preliminary level of design information does not allow for a detailed analysis of potential acoustic effects on fish from in-water construction activities. However, it is expected that the potential for adverse acoustic effects on managed species would principally be associated with pile driving to construct the foundational support systems of bridges and elevated rail structures at the CFR crossings. Anticipated pile types and installation/construction methods include the installation of pre-cast concrete piles by impact and/or vibratory pile drivers and/or the construction of drilled shaft cast-in-place concrete piles. Drilled shaft pile construction typically involves pre-drilling a pile shaft, installing a temporary or permanent steel casing to keep the shaft open, inserting a rebar cage, and filling the shaft with liquid concrete. Steel casings are typically installed with a vibratory pile driver, which may also be required for the removal of temporary steel casings. Generally, the underwater sounds produced by impact pile drivers have the highest potential to cause direct injury to marine organisms, whereas the sounds produced by vibratory pile driving are more likely to have behavioral effects (Wickliffe et al. 2019). The use of drilled shaft concrete piles would generally be expected to have the least potential for adverse acoustic effects, as the use of a vibratory hammer would be limited to the installation of steel casings in pre-drilled shafts. The FRA will coordinate with NMFS to conduct a quantitative assessment of underwater acoustic effects once detailed designed plans and construction methods have been developed. If determined to be necessary, the FRA will coordinate with NMFS to develop and implement effective noise attenuation and mitigation measures.

5.7 Water Quality Effects

Sediment suspension by in-water construction activities and associated increases in turbidity would temporarily degrade water quality in the vicinity of the active construction area. Construction-induced increases in suspended sediment concentrations and turbidity would potentially affect the behaviors (e.g., feeding, predator avoidance, habitat selection) and physiology (e.g., gill-breathing) of marine and estuarine fishes (Michel et al. 2013). Additionally, the redeposition of suspended sediments can impact benthic invertebrate prey through direct burial and/or adverse effects on gill-breathing and filter-feeding functions. In regard to dredging-induced sediment suspension in the federal navigation channel, a study was undertaken to determine the spatial extent of sediment plumes and their potential to affect fish utilization of nursery habitats that are adjacent to the channel (Reine et al. 2002). The study found that barge overflow plumes and elevated suspended sediment concentrations were narrowly confined to the navigation channel under both ebb and flood tidal conditions, with significant settling of the plumes to the lower portion of the water column occurring within ~300 meters of the barges. A maximum Total Suspended Solids (TSS) concentration of 191 mg/L was recorded within the plume at the sampling point nearest the barge, whereas maximum TSS concentrations of 60 to 80 mg/L were recorded in the plume at a distance of 300 m. During active dredging, TSS concentrations over the adjacent nursery habitats remained similar to ambient conditions, with measured concentrations ranging from 19 to 33 mg/L. No evidence of plume migration or elevated TSS

concentrations was detected over the adjacent habitats. In regard to the proposed action, the results of this study indicate that sediment suspension by in-water construction activities would be localized and primarily confined to the deep-water portion of the channel.

6.0 AVOIDANCE AND MINIMIZATION

The preliminary project design incorporates several structural and routing measures to avoid and minimize impacts on EFH/HAPC habitats. The use of an elevated rail structure across Eagle Island will greatly reduce direct impacts on tidal marsh in relation to the use of an at-grade rail trackbed. In regard to the upper at-grade rail segment, routing the alignment along the disturbed outer margin of the tidal floodplain will substantially reduce direct impacts on high quality tidal marsh as well as the overall extent of direct impacts on tidal marsh. Further reduction of direct wetland impacts will be achieved through the use of abandoned rail beds for portions of the upper at-grade rail segment. Routing the upper at-grade rail segment along the outer margin of the tidal floodplain will also greatly reduce the potential for impacts on tidal marshes via tidal restriction. Other potential avoidance and minimization measures will be incorporated as necessary during the final phase of engineering design. The FRA will coordinate with NMFS throughout the engineering design and permitting processes to ensure that adverse effects on EFH/HAPC and federally managed species are effectively avoided, minimized, or otherwise mitigated.

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Appendix A

Wilmington Rail Realignment
Plan and Profile

U.S. Department
of Transportation

1200 New Jersey Avenue, SE
Washington, DC 20590

**Federal Railroad
Administration**

June 2, 2022

United States Fish and Wildlife Service
Raleigh Field Office
John Ellis
Federal Project Review Under ESA
551-F Pylon Drive
Raleigh, NC 27606

RE: City of Wilmington Rail Realignment Project – ESA Section 7 Coordination

Dear Mr. Ellis,

The Federal Railroad Administration as the lead Federal Agency, in coordination with the City of Wilmington (City), has initiated an Environmental Assessment (EA) for a proposed new freight rail route to bypass the existing route between Navassa (Davis Yard) and the Port of Wilmington. The project, referred to as the Wilmington Rail Realignment, involves realigning an existing CSX Transportation (CSXT) freight rail line that traverses through City limits as well as unincorporated areas of Brunswick and New Hanover counties. The attached Figure 1 identifies the No-Build corridor and the Preferred Alternative for the project. The primary purpose of the project is to improve safety, regional transportation mobility, and freight rail operations, while also improving the resiliency, reliability, and operational fluidity of the sole freight rail route connecting southeastern North Carolina with the Port of Wilmington.

The information presented in this letter and attached is being provided as a follow-up to our January 26, 2022 coordination call. We are requesting comment regarding the potential effects of the project on federally listed species in accordance with Section 7 of the Endangered Species Act. Please note letters are also being sent to the NOAA – National Marine Fisheries Service: one to Mr. Andrew Herndon, regarding coordination on Endangered Species Act (ESA)-related issues and one to Mr. Fritz Rohde, regarding an Essential Fish Habitat (EFH) Assessment that addresses the effects of the proposed action on federally managed species and EFH.

Endangered Species Act Section 7 Coordination

Eleven species listed by the U.S. Fish and Wildlife Service in Brunswick County and New Hanover County have been identified for assessing effects of project actions. Table 1 identifies these listed species and includes a biological conclusion for each based on habitat evaluations and surveys conducted.

During the spring of 2021, surveys were conducted for some of the listed species with limited/no available existing data on presence/absence in a study area that included the Preferred Alternative including eastern black rail (*Laterallus jamaicensis)*, Cooley's meadowrue (*Thalictrum cooleyi*), golden sedge (*Carex lutea*), and rough-leaved loosestrife (*Lysimachia asperulaefolia*). Eastern black rail surveys were conducted using broadcast-response methodology between April and June at six land-based sites and five water-based sites. No eastern black rail were observed during these surveys. On April 8, 2021 a survey for the listed plant species occurred. It was determined that no suitable habitat existed for those listed plants within the area reviewed, including the Preferred Alternative impact area, therefore no additional information is provided in this letter. The results of the plant survey are included as an attachment.

Table 1. Federally listed species requiring Section 7 coordination

Common Name	Scientific Name	Federal Status[1]	County[2]	Habitat Present	Biological Conclusion[3]
American alligator	*Alligator mississippiensis*	T(S/A)	B, NH	Yes	Not Required
Eastern black rail	*Laterallus jamaicensis*	T	NH	Yes	MANLAA
Piping plover	*Charadrius melodus*	T	B, NH	No	NE
Red knot	*Calidris canutus rufa*	T	B, NH	No	NE
Red-cockaded woodpecker	*Picoides borealis*	E	B, NH	No	NE
Wood stork	*Mycteria americana*	T	B	Yes	MANLAA
West Indian manatee	*Trichechus manatus*	E	B, NH	Yes	MANLAA
Northern long-eared bat	*Myotis septentrionalis*	T	NH	Yes	MALAA – 4(d) Rule
Cooley's meadowrue	*Thalictrum cooleyi*	E	B, NH	No	NE
Golden sedge	*Carex lutea*	E	NH	No	NE
Rough-leaved loosestrife	*Lysimachia asperulaefolia*	E	B, NH	No	NE

[1] E=endangered; T=threatened; T(S/A) =threatened due to similarity of appearance.

[2] B=Brunswick County; NH=New Hanover County

[3] Biological Conclusions: MALAA = May Affect Likely to Adversely Affect; MANLAA = May Affect Not Likely to Adversely Affect; NE= No Effect

Information pertaining to eastern black rail, wood stork, West Indian manatee, and northern long-eared bat, is provided below. Habitat requirements for each species are based on the best currently available information from referenced literature, NCDOT, USFWS, and NMFS.

Eastern black rail

USFWS Recommended Survey Window: April 1 – June 30

Habitat Description: Eastern black rail habitat can be tidally or non-tidally influenced, and range in salinity from salt to brackish to fresh. Tidal height and volume vary greatly between the Atlantic and Gulf coasts and therefore contribute to differences in salt marsh cover plants in the bird's habitat. Further south along the Atlantic coast, eastern black rail habitat includes impounded and unimpounded salt and brackish marshes.

Biological Conclusion: May Affect – Not Likely to Adversely Affect

During habitat assessments conducted on February 22-26 and March 1-5, 2021, it was determined potential suitable habitat is present for the eastern black rail in the tidal marsh areas where common reed was not dominant within the area reviewed, including the Preferred Alternative. A review of North Carolina Natural Heritage Program (NHP) records on December 28, 2021 indicates no known occurrences within 1.0 mile of the Preferred Alternative. Surveys were performed by Dial Cordy and Associates, Inc., in 2021 during and shortly after the peak breeding season when the bird vocalizations are highest (April 15-May 31) on

the following dates: April 22 and 23; May 3, 5, 13, 14, 21; and June 2, 7, 8, and 14. The protocol used for this survey focused on passive listening and broadcasting intermittent eastern black rail vocalizations to assess eastern black rail populations. The methods followed during this survey were adapted from the USFWS Southeast Region, 2017 *Secretive Marsh Bird Survey Protocol* which is adapted from the *Standardized North American Marsh Bird Monitoring Protocol*[1] [2]. No eastern black rail were heard in response to the calls during the five replicate surveys at the six land- and five water-based stations. Most of the Preferred Alternative impact area has very minimal high marsh due to anthropogenic modification of the system. Based on the lack of high marsh habitat common to this area of the river, the habitat located within the Preferred Alternative impact area would not be expected to be used commonly by eastern black rail for nesting, as occurs in the lower more saline and less disturbed portions of the Cape Fear River. Therefore, the project may affect but is not likely to adversely affect eastern black rail. The results of the eastern black rail survey are attached.

Wood stork

USFWS Recommended Survey Window: April 15 – July 15

Habitat Description: Wood storks are known to occur in several coastal North Carolina counties, and records indicate that they have been breeding in North Carolina since 2005. Wood storks typically construct their nests in medium to tall trees that occur in stands located either in swamps or on islands surrounded by relatively broad expanses of open water. In many areas, bald cypress and red mangrove trees are preferred. During the nonbreeding season or while foraging, wood storks occur in a wide variety of wetland habitats, including freshwater marshes and stock ponds, shallow, seasonally flooded roadside or agricultural ditches, narrow tidal creeks or shallow tidal pools, managed impoundments, and depressions in cypress heads and swamp sloughs. Because of their specialized feeding behavior, the most attractive feeding areas are swamp or marsh depressions where fish become concentrated during dry periods.

Biological Conclusion: May Affect – Not Likely to Adversely Affect

During habitat assessments conducted on February 22-26 and March 1-5, 2021, it was determined suitable foraging habitat is present for wood stork in the marshes, swamps, woody wetlands, ditches, and creeks identified in the Preferred Alternative. A review of NHP records on December 28, 2021 indicates no known occurrences within 1.0 mile of the Preferred Alternative. Due to low populations of wood stork in the vicinity of the Preferred Alternative and the nearest rookery documented nearly 40 miles away in Brunswick County, the project is not likely to adversely affect wood stork.

West Indian manatee

USFWS Recommended Survey Window: year round

Habitat Description: Manatees have been observed in all the North Carolina coastal counties. Manatees are found in canals, sluggish rivers, estuarine habitats, saltwater bays, and as far off shore as 3.7 miles. They utilize freshwater and marine habitats at shallow depths of 5 to 20 feet. In the winter, between October and April, manatees concentrate in areas with warm water. During other times of the year habitats appropriate for the manatee are those with sufficient water depth, an adequate food supply, and in proximity to freshwater. Manatees require a source of freshwater to drink. Manatees are primarily herbivorous, feeding on any aquatic vegetation present, but they may occasionally feed on fish.

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[1] Smith, Adam. Wiest, Whitney. 2017. 2017 Secretive Marsh Bird Survey - USFWS Southeast Region. United States Fish and Wildlife Service, Unpublished Report.

[2] Conway, C. J. 2009. Standardized North American Marsh Bird Monitoring Protocols.

Biological Conclusion: May Affect – Not Likely to Adversely Affect

Suitable habitat for the West Indian manatee is present in the Cape Fear River and streams with water depths greater than or equal to 5 feet. A review of NHP records on December 28, 2021 indicates a known occurrence within 1.0 mile of the Preferred Alternative. Construction activities in suitable habitat will adhere to *Guidelines for Avoiding Impacts to the West Indian Manatee: Precautionary Measures for Construction Activities in North Carolina Waters*. Therefore, the project may affect but is not likely to adversely affect West Indian manatee.

Northern long-eared bat

USFWS Recommended Survey Window: June 1 – August 15

Habitat Description: In North Carolina, the Northern long-eared bat (NLEB) occurs in the mountains, with scattered records in the Piedmont and coastal plain. In western North Carolina, NLEB spend winter hibernating in caves and mines. Since this species is not known to be a long-distance migrant, and caves and subterranean mines are extremely rare in eastern North Carolina, it is uncertain whether or where NLEB hibernate in eastern North Carolina. During the summer, NLEB roost singly or in colonies underneath bark, in cavities, or in crevices of both live and dead trees (typically ≥3 inches dbh). Males and non-reproductive females may also roost in cooler places, like caves and mines. This bat has also been found, rarely, roosting in structures like barns and sheds, under eaves of buildings, behind window shutters, in bridges, and in bat houses. Foraging occurs on forested hillsides and ridges, and occasionally over forest clearings, over water, and along tree-lined corridors. Mature forests may be an important habitat type for foraging.

Biological Conclusion: May Affect – Subject to the Final 4(d) Rule

During habitat assessments conducted on February 22-26 and March 1-5, 2021, it was determined suitable habitat was present for NLEB in areas with snags and non-isolated trees with a dbh greater than 3 inches. According to records last updated on March 24, 2020 presented by the USFWS Raleigh Ecological Services Field Office, there are no known NLEB winter roost trees in Brunswick and New Hanover Counties. A review of NHP records on December 28, 2021 indicates a known occurrence within 1.0 mile of the project area. The Programmatic Biological Opinion on Final 4(d) Rule will be followed to satisfy Section 7 consultation with USFWS.

Bald Eagle

A general corridor nest survey for Bald Eagle was performed on April 1 and 8, 2021. Additional surveys of known nests occurred April 1, 9, and 12 2021. One active nest (Element Occurrence #27956) was noted. A fledgling was observed on April 12, 2021. Based on this, consultation with the USFWS pursuant to the Eagle Act will be required for the Project. As discussed in our January 26, 2022 coordination call, separate coordination for a potential Bald Eagle permit will be required through a different office of the USFWS (Resee Collins).

Closing

FRA requests your comments regarding the information provided in this letter and in the attached survey reports as we continue preparation of the Environmental Assessment.

We look forward to a collaborative working relationship with the USFWS on this project. If you have any questions or would like to discuss in more detail the project or our agencies' respective roles and responsibilities during preparation of the EA, please contact Kevin Wright at 202-868-2628 or kevin.wright@dot.gov.

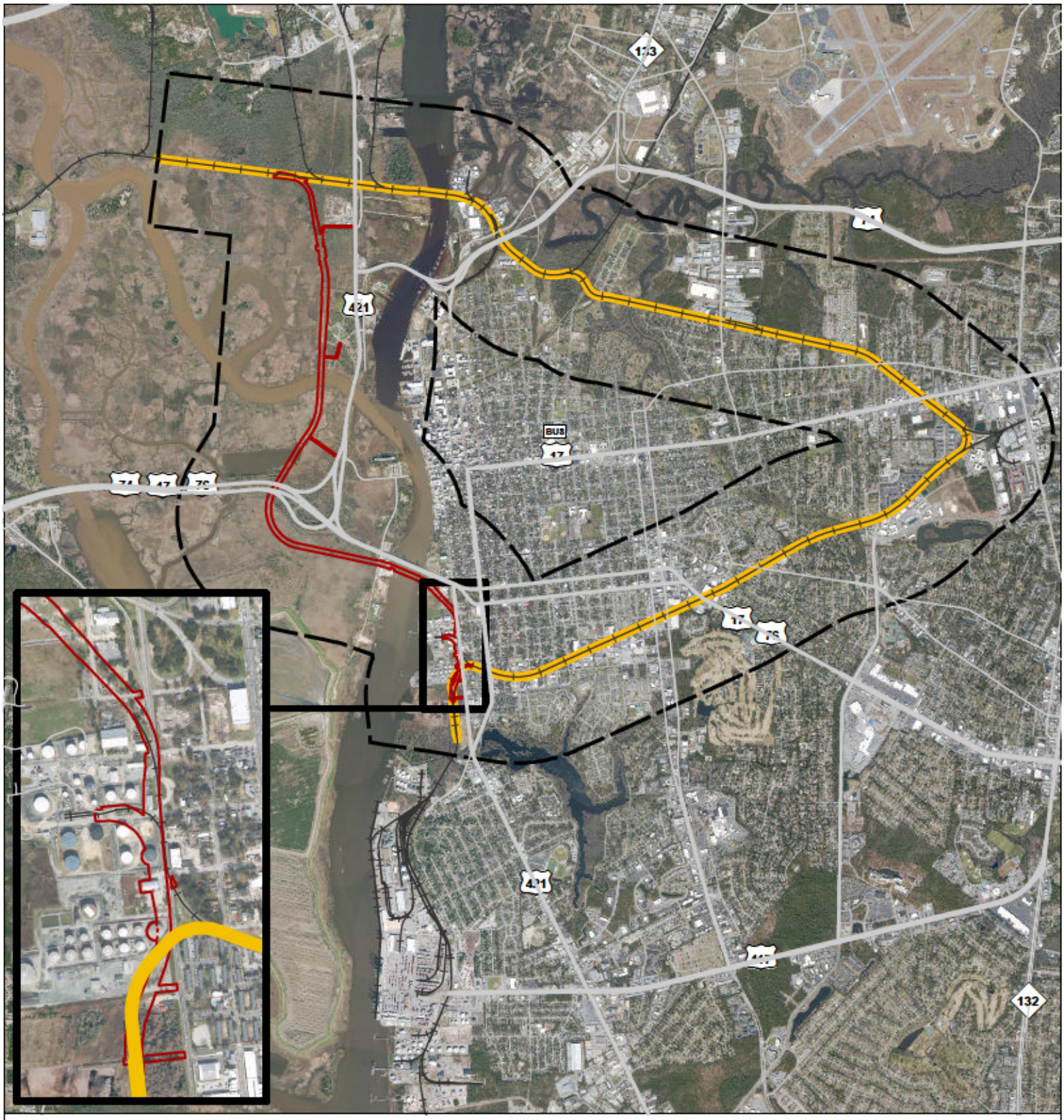
Sincerely,

Brandon Bratcher
Supervisory Environmental Protection Specialist

Attachments (4):

Figure 1 Study Area
WRR Black Rail Survey
WRR Plant Survey
Bald Eagle Survey

Cc: Aubrey Parsley, City of Wilmington



CITY OF WILMINGTON NORTH CAROLINA

Wilmington Rail Realignment Project

New Hanover County and Brunswick County, NC

Source: Esri Aerial Imagery

Legend

- Project Study Area
- Preferred Alternative Impact Area
- No-Build Corridor
- Railroad

Figure 1
No-Build and Preferred Alternative Corridors

Date: January 2022

0 0.25 0.5 1
Miles

1 inch = 4,000 feet

201 N. Front Street,
Wilmington, NC
(910) 251-9790 Fax

DIAL CORDY
AND ASSOCIATES INC
Environmental Consultants

Suite 307
238401
(910) 251-9409

July 9, 2021

Jeff Mann
Project Manager
AECOM
201 N. Front Street
Suite 509
Wilmington, NC 28401

Re: City of Wilmington Rail Realignment EA – Draft Black Rail Survey Report

Dear Jeff,

Dial Cordy and Associates Inc. (DCA) was contracted by AECOM to develop a survey plan for black rail (*Laterallus jamaicensis*), gain concurrence from USFWS, implement the survey, and prepare this letter report. An introduction to the black rails status, a review of the approved survey methods, and survey results are summarized below.

Introduction

Marsh dependent birds are those that primarily inhabit marsh habitats and many of these species are considered "inconspicuous" or "secretive" in their behavior (Conway 2009). These species include rails, bitterns, herons, egrets, grebes, gallinules, and snipes that typically inhabit dense persistent emergent vegetation in fresh and/or brackish aquatic environments. Except during the breeding season, many of these marsh bird species vocalize infrequently and remain hidden from typical survey methods such as point counts and road-side surveys. As such, call-response surveys are utilized to elicit vocalizations to provide estimations of marsh bird populations. Marsh bird populations are good indicators of environmental health, as marsh birds rely on abundant and diverse fish, amphibian, and invertebrate populations, which are in turn, reliant on good water quality.

Due to their secretive nature and challenging habitat to survey, marsh bird population monitoring data is often limited or lacking in many areas. To our knowledge, no systematic marsh bird surveys have occurred within the project area; however, observations from local birders have identified many marsh bird species in the lower Cape Fear River watershed, including the black rail. One of the most imperiled marsh bird species in North America today is the black rail (Wilson et al 2016). Population declines are linked to habitat loss, tidal flooding, sea level rise, and increasing storm intensity and frequency. Its endangered status listing by the United States Fish and Wildlife Service (USFWS) on 9 November 2020, reinforces the population is in jeopardy. The black rail is known to occur close to the project area as observations have occurred in Southport (4 January 2007) and Wilmington (5 January 2007) (Davis 2008).

Survey Methods

A draft survey plan for black rail was forwarded to the USFWS (John Ellis and John Hammond) on 1 April 2021 to gain approval for the proposed methods. On 20 April 2021 John Hammond concurred with our methods but requested that five replicate surveys be scheduled, rather than the two proposed.

The USFWS approved survey plan is summarized below:

Due to their secretive nature and the habitat preferred by the black rail, species specific survey protocols have been developed and revised over the last decade to increase the likelihood of observing this species. The protocol used for this survey focuses on passive listening and broadcasting intermittent black rail vocalizations to assess black rail populations. Surveys were performed during and shortly after the peak breeding season when bird vocalizations are highest (15 April – 31 May) (Conway 2009). The methods followed during this survey were adapted from the United States Fish and Wildlife Service (USFWS) Southeast Region, 2017 Secretive Marsh Bird Survey Protocol (Smith and Wiest 2017) which is adapted from the Standard North American Marsh Bird Monitoring Protocol (Conway 2009). Standard playback files were acquired from the USFWS and used by DCA biologists. The file attained was 12 minutes and 15 seconds in length consisting of fifteen seconds of "burn in time", followed by two minutes of passive listening, followed by intermittent calls starting with three "Ki Ki Kerr" calls, one "Ik Ik" call, one "growl", and one additional minute of silence. The call sequence MP3 file was loaded onto an MP3 player and broadcast via a Bluetooth amplified speaker (Ankor Soundcore, Model # A3102011). A sound level meter was used to ensure the broadcast was between 70-80 dB (Meterk model: MK09) before every survey. The speaker was mounted to a PVC pole that was inserted into the ground at each survey point and the speaker was oriented to face the largest expanse of marsh.

The surveys were conducted approximately 30 minutes before sunrise to 2.5 hours after sunrise and 2.5 hours before sunset to 30 minutes after sunset. The area covered by the Wilmington Rail Realignment corridor limited the number of broadcast stations to six land stations and five shoreline stations. Consultation with the USFWS on site selection occurred in early April and no additional sites were requested (Figure 1, Table 1). The minimum spacing advised for call/response surveys is 400 meters between each site to prevent any potential overlap of calling birds. One survey replicate consisted of surveying all stations within one week. Survey stations were selected near high marsh areas away from roads, where possible.

Many factors can limit the ability of an observer to hear marsh bird vocalizations; however, wind may be the most limiting factor when conducting call-response surveys. As such, surveys were limited to days with winds less than 20 kilometers/hour (12 miles/hour). Surveyors used a handheld anemometer before and during surveys to ensure winds were acceptable for surveys. Additionally, heavy fog and sustained rain can limit marsh bird vocalizations and should be avoided. The tide stage can also affect detectability of some marsh birds and due to the lunar tide experienced within the Cape Fear, surveys were scheduled around the tides when feasible.

Figure 1. City of Wilmington Rail Realignment Corridor Black Rail Survey Stations, Wilmington, NC (Spring 2021).

Table 1. Wilmington Rail Realignment Black Rail Survey Stations Wilmington, North Carolina (Spring 2021).

	Point I.D.	Latitude (DD)	Longitude (DD)
Land Route	L-1	34.22680000	77.95568333
	L-2	34.23316667	77.96628333
	L-3	34.24498333	77.96048333
	L-4	34.24603333	77.96066667
	L-5	34.25031667	77.96081667
	L-6	34.25505000	77.96096667
Water Route	W-1	34.23785000	77.96311667
	W-2	34.24238333	77.96168333
	W-3	34.24206667	77.95863333
	W-4	34.24376667	77.96151667
	W-5	34.24715000	77.96233333

Results

Survey dates and weather conditions for both land and water-based surveys are provided in Table 2. During the surveys, the weather conditions were generally good with very little precipitation. The majority of the sites are relatively protected which reduced the influence the wind had on creating background noise. A description of the habitat at each survey station is provided below.

Habitat Descriptions of Survey Stations

Station L1

The tidal floodplain at Station L1 is entirely dominated by dense monospecific common reed (*Phragmites australis*) stands on dredged material deposits. The stands along Battleship Road that were visually examined appear to be positioned just above MHW where flooding is intermittent by higher than average high tides.

Table 2. Wilmington Rail Realignment Black Rail Call/Response Station Survey Dates and Weather Conditions Wilmington, North Carolina (Spring 2021).

Survey Type	Date	Temp Range (F)	Cloud Cover Range	Precipitation	Wind Range	Ambient Noise Level Range
Land - Morning	4/22/2021	60-64	0-1	None	2-4	2-4
Water - Morning	4/23/2021	52-54	0	None	1	1-3
Water- Evening	5/3/2021	81-82	2	None	3-4	1-4
Land - Evening	5/5/2021	82	1-2	None	3-4	2-3
Land - Morning	5/13/2021	47-51	1-2	None	1-3	1-2
Water - Morning	5/14/2021	54	0	None	1	2
*Water - Morning	5/21/2021	62	0	None	1	1-2
Land - Evening	6/2/2021	77-80	2-5	light drizzle at L3	1-4	1-3
Water-Morning	6/7/2021	77-79	1	None	1	1-2
Land-Evening	6/8/2021	78-81	1	None	0-1	1
Water -Morning	6/14/2021	69-73	1	None	2	1-2

Cloud Cover: 0 -clear or a few clouds, 1-partly cloudy or variable sky, 2-cloudy or overcast, 4-fog or smoke, 5-drizzle, 6-snow, 8-showers

Wind: 0-Smoke rises vertically, 1-wind direction shown by smoke, 2-wind felt on face, 3-leaves and twigs in constant motion, 4-raises dust and loose paper, 5-small trees sway; crested wavelets on inland water

Noise: 0-no noise, 1-faint, 2-moderate, 3-loud, 4-intense

* Makeup date for Station W1 and W5 on 5/14/21

Station L2

The tidal floodplain at Station L2 is strongly dominated by monospecific narrowleaf cattail (*Typha angustifolia*) marshes. The cattail marshes are interspersed with dense patches of common reed on elevated dredged material deposits and scattered salt-stressed trees and shrubs such as bald cypress (*Taxodium distichum*), red maple (*Acer rubrum*), Chinese tallow (*Triadica sebifera*), and wax myrtle (*Morella cerifera*). The position of the MHW line appears to be near the upland boundary along US Highway 74/76. The common reed stands generally occur on tidally-restricted dredged material deposits that are intermittently flooded by higher than average high tides. Otherwise, supratidal high marsh zones that would constitute suitable black rail nesting habitat appear to be absent at this location.

Stations L3 and L4

Dense monospecific common reed stands comprise a 200- to 400-ft-wide zone along the upland boundary at Stations L3 and L4. The remainder of the tidal floodplain between the common reed stands and the Cape Fear River channel is dominated by monospecific cattail marshes. The position of the MHW line appears to be near the upland boundary. The uppermost fringes of the common zone appear to be just above MHW where flooding is intermittent by higher than average high tides. Otherwise, supratidal high marsh zones that would constitute suitable black rail nesting habitat appear to be absent at these locations.

Station L5

The outer portion of the tidal floodplain along the upland boundary at Station L5 is strongly dominated by dense monospecific common reed stands on elevated fill material. The remainder of the tidal floodplain between the common reed stands and the Cape Fear River channel is dominated by monospecific cattail marshes that are interspersed with a few scattered salt-stressed trees (bald cypress). The common reed stands generally occur on tidally-restricted ditch spoil berms and other elevated fill deposits that are intermittently flooded by higher than average high tides. Otherwise, supratidal high marsh zones that would constitute suitable black rail nesting habitat appear to be absent at this location.

Station L6

A narrow (~20-ft-wide) tidal marsh zone along the upland boundary at Station L6 is dominated by narrowleaf cattail and soft-stem bulrush (*Schoenoplectus tabernaemontani*). The remainder of the tidal floodplain is strongly dominated by monospecific narrowleaf cattail marshes. The cattail marshes are interspersed with scattered dead and severely salt-stressed trees and shrubs such as bald cypress, green ash (*Fraxinus pennsylvanica*), swamp tupelo (*Nyssa biflora*), and wax myrtle. The position of the MHW line appears to be within a few feet of the upland boundary. Supratidal high marsh zones that would constitute suitable black rail nesting habitat appear to be absent at this location.

Station W1

The tidal floodplain at Station W1 is dominated by a combination of monospecific narrowleaf cattail marshes and monospecific common reed stands. The cattail marshes are interspersed with small, isolated upland scrub-shrub areas that are dominated by Chinese tallow, Chinaberry (*Melia azedarach*), and wax myrtle. The common reed stands generally occur on tidally-restricted dredged material deposits that are intermittently flooded by higher than average high tides. Otherwise, supratidal high marsh zones that would constitute suitable black rail nesting habitat appear to be absent at this location.

Station W2

A narrow (~20-ft-wide) tidal marsh zone on the slightly elevated river- bank is dominated by narrowleaf cattail and softstem bulrush with scattered big cordgrass (*Spartina cynosuroides*) and saltmarsh water-hemp (*Amaranthus cannabinus*). The top-of-bank zone is backed by

expansive monospecific narrowleaf cattail marshes. Supratidal high marsh zones that would constitute suitable black rail nesting habitat appear to be absent at this location.

Station W3

A fringing (5- to 10-ft-wide) smooth cordgrass (*Spartina alterniflora*) zone along the edge of the river channel is backed by a narrow (~50-ft-wide) big cordgrass-saltmarsh bulrush (*Bolboschoenus robustus*) zone on the elevated river- bank. The tidal floodplain beyond the top-of-bank zone is highly altered by dredged material deposits and is dominated by a combination of monospecific narrowleaf cattail marshes, monospecific common reed stands, and isolated upland scrub-shrub areas. Typical woody species of the upland scrub-shrub areas include Chinese tallow, Chinaberry, and wax myrtle. The common reed stands generally occur on tidally-restricted dredged material deposits that are intermittently flooded by higher than average high tides. Otherwise, supratidal high marsh zones that would constitute suitable black rail nesting habitat appear to be absent at this location.

Station W4

A narrow (~50-ft-wide) big cordgrass zone occurs on the slightly elevated river- bank. The tidal floodplain beyond the top-of-bank zone is dominated by a combination of monospecific narrowleaf cattail marshes and monospecific common reed stands. The common reed stands generally occur on tidally-restricted dredged material deposits that are intermittently flooded by higher than average high tides. Otherwise, supratidal high marsh zones that would constitute suitable black rail nesting habitat appear to be absent at this location.

Station W5

Dense monospecific common reed stands comprise a 200- to 400-ft-wide zone along the upland boundary at Stations W5. The remainder of the tidal floodplain between the common reed stands and the Cape Fear River channel is dominated by monospecific cattail marshes. A narrow (~20-ft-wide) tidal marsh zone on the slightly elevated banks of the Cape Fear River and the main rice canals is dominated by narrowleaf cattail, big cordgrass, softstem bulrush, and wild rice (*Zizania aquatica*). The uppermost portions of the common reed zone along the upland boundary appear to be just above MHW where flooding is intermittent by higher than average high tides. Otherwise, supratidal high marsh zones that would constitute suitable black rail nesting habitat appear to be absent at this location.

Marsh Bird Observations

No black rail were heard in response to the calls during all five replicate surveys at the six land- and five water-based stations. Clapper/king rails (*Rallus crepitans*, *Rallus elegans*) were detected at land Station 4 and all water stations during several of the surveys in response to the calls. Over the course of the survey, 15 clapper/king rails were detected (Table 3). The vocalizations of the clapper rail and king rail are essentially indistinguishable, and the Standard North American Marsh Bird Monitoring Program suggests recording the vocalizations heard as clapper/king rails in areas where both species may occur. Additionally, one least bittern (*Ixobrychus exilis*) was observed at water station 1.

Table 3. Wilmington Rail Realignment Marsh Bird Observations Wilmington, North Carolina (Spring 2021).

Station	Date	Common Name	Scientific Name
Land - 4	4/22/2021	Clapper/King Rail	*Rallus crepitans, Rallus elegans*
Water - 1	4/23/2021	Clapper/King Rail	*Rallus crepitans, Rallus elegans*
Water - 2	4/23/2021	Clapper/King Rail	*Rallus crepitans, Rallus elegans*
Water - 5	4/23/2021	Clapper/King Rail	*Rallus crepitans, Rallus elegans*
Water - 3	5/3/2021	Clapper/King Rail	*Rallus crepitans, Rallus elegans*
Water - 3	5/14/2021	Clapper/King Rail	*Rallus crepitans, Rallus elegans*
Water - 1	5/21/2021	Clapper/King Rail	*Rallus crepitans, Rallus elegans*
Water - 1	5/21/2021	Clapper/King Rail	*Rallus crepitans, Rallus elegans*
Water - 1	5/21/2021	Clapper/King Rail	*Rallus crepitans, Rallus elegans*
Water - 1	5/21/2021	Clapper/King Rail	*Rallus crepitans, Rallus elegans*
Water - 1	5/21/2021	Clapper/King Rail	*Rallus crepitans, Rallus elegans*
Water - 1	6/7/2021	Clapper/King Rail	*Rallus crepitans, Rallus elegans*
Water - 1	6/7/2021	Clapper/King Rail	*Rallus crepitans, Rallus elegans*
Water - 1	6/7/2021	Least Bittern	*Ixobrychus exilis*
Water - 1	6/7/2021	Clapper/King Rail	*Rallus crepitans, Rallus elegans*
Water - 4	6/14/2021	Clapper/King Rail	*Rallus crepitans, Rallus elegans*

The preferred habitat of the black rail is the high marsh. The high marsh is typically only inundated during extreme high tide events and is dominated by plants such as marsh elder (*Iva frutescens)*, saltgrass (*Distichlils spicata)*, and salt meadow hay (*Spartina patens)*. The majority of the area within the proposed rail realignment corridor has very minimal high marsh due to anthropogenic modification of the system. Based on the lack of high marsh habitat common to this area of the river, the habitat located within the study area would not be expected to be used commonly by black rail for nesting, as occurs in the lower more saline and less disturbed portions of the Cape Fear River.

Literature Cited

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Davis, Ricky. 2008. Briefs for the Files. The Chat Vol 72 No 2 Spring 2008, Carolina Bird Club, 608 Smallwood Drive, Rocky Mount, NC 27804. Unpublished Report.

Smith, Adam. Wiest, Whitney. 2017. 2017 Secretive Marsh Bird Survey -USFWS Southeast Region. United States Fish and Wildlife Service, Unpublished Report.

Wilson, M.D., B. D. Watts, and D. Poulton. 2016. Black Rail Status Survey in North Carolina. Center for Biology Technical Report Series, CCBTR-16-01. College of William and Mary and Virginia Commonwealth University. 21 pp.

Should you have any questions regarding the content of our report, please contact either James Hargrove or myself.

Regards,

Dial Cordy and Associates Inc.

R Steve Dial

R. Steve Dial
President

DIAL CORDY
AND ASSOCIATES INC
Environmental Consultants

201 N. Front Street, Suite 307
Wilmington, NC 28401
(910) 251-9790

24 August, 2021

Jeff Mann
Project Manager
AECOM
201 N. Front Street
Suite 509
Wilmington, NC 28401

Re: City of Wilmington Rail Realignment Rail EA – Listed Plant Species Survey

Dear Mr. Mann:

Dial Cordy and Associates Inc. (DCA) has completed the federally listed plant species survey and habitat assessment for the identified area of potentially suitable habitat along US 421 in Brunswick County (Figure 1). A survey and habitat suitability assessment for Cooley's Meadowrue (*Thalictrum cooleyi*), golden sedge (*Carex lutea*), and rough-leaved loosestrife (*Lysimachia asperulifolia*) was conducted by DCA staff Rahlff Ingle (MS Botany NCSU) and James Hargrove on 8 April 2021. No occurrences of listed plant species were encountered during the survey. Furthermore, based on the habitat assessment provided below, the assessment area does not contain suitable habitat for any of the listed plant species.

Habitat Assessment

The assessment area is located along the western margin of US 421 on the tidal floodplain of the Cape Fear River. Soils are mapped by the NRCS as Chowan silt loam. Tidal hydrology has been modified by filling and grading, including the construction of an elevated road bed/powerline corridor that bisects the site. The site contains a disturbed supratidal to non-tidal swamp forest community with an open canopy of red maple (*Acer rubrum*), sweet-gum (*Liquidambar styraciflua*), swamp tupelo (*Nyssa biflora*), and eastern cottonwood (*Populus deltoides*). The very dense to moderately dense shrub layer is dominated by Chinese privet (*Ligustrum sinense*), sweetgum, Chinese tallow-tree (*Triadica sebifera*), wax myrtle (*Morella cerifera*), and silverling (*Baccharis halimifolia*). The sparse groundcover stratum is dominated by Japanese stilt-grass (*Microstegium vimineum*) and woody vines such as poison ivy (*Toxicodendron radicans*),

honeysuckle (*Lonicera japonica*), and Virginia creeper (*Parthenocisus quinquefolia*). Known occurrences of Cooley's meadowrue and golden sedge are associated with ecotones between fire-maintained pine savannas and non-riverine swamp forests; including powerline corridors where the typical assemblage of savanna herbaceous species is maintained by mowing (Suiter and LeBlond 2014). Similarly, rough-leaved loosestrife is associated with ecotones between longleaf pine savannas and pocosin communities; including roadside depressions and powerline corridors where the typical assemblage of savanna herbaceous species is maintained by artificial disturbance (Suiter 2014). The tidal floodplain habitats of the assessment area do not constitute suitable habitat for any of these species.

Regards,

R Steve Dial

R Steve Dial
President

Figure 1. Assessment Area.

DIAL CORDY
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201 N. Front Street, Suite 307
Wilmington, NC 28401
(910) 251-9790

June 15, 2021

Jeff Mann
Project Manager
AECOM
201 N. Front Street
Suite 509
Wilmington, NC 28401

Re: City of Wilmington Rail Realignment Rail EA – Bald Eagle Survey

Dear Mr. Mann:

Dial Cordy and Associates Inc. (DCA) has completed the bald eagle (*Haliaeetus leucocephalus*) nest survey for the above study and is submitting this letter report as part of our contractual requirements with AECOM. The bald eagle is protected under the Bald and Golden Eagle Protection Act (Eagle Act) and the Migratory Bird Treaty Act (MBTA), which prohibit the take of bald eagles and their nests without a permit. In accordance with survey protocol contained in the National Bald Eagle Management Guidelines (USFWS 2007) and the NCDOT Guidelines to Assess Potential Project Impacts to the Bald Eagle and Survey Protocols (NCDOT 2015), a pedestrian survey of the study corridor, inclusive of a 660-ft buffer, was performed to identify bald eagle nests and determine the status of the one known nest (Element Occurrence # 27956), and an older historic nest location located at the north end of the corridor (Figure 1). All forested areas and potential nest trees within the corridor were visually inspected for the presence of nests. The general corridor nest survey was performed on April 1 and 8, 2021. Known nest status surveys were conducted between 0630-0800 am on April 1, 9 and 12, 2021. DCA staff participating in the surveys included James Hargrove, Rahlff Ingle, and Steve Dial.

Survey Results and Observations

No bald eagle nests were observed within the survey area other than the one known nest cited above (EO # 27956). Surveys of the known nest site documented the presence of an active nest with at least one eaglet (Photograph 1 and 2). The nest is positioned near the top of a large loblolly pine (*Pinus taeda*) that is 80-90 feet (ft) in height and ~20 inch (in) diameter at breast height. The nest tree coordinates are N 34º 15.482', W 077º 57.755', located 233 ft west of the corridor (Figure 1). During the first visit on 1 April 2021, the male eagle responded to our presence

by posting on trees over 300 ft from the nest tree and flying in large circles around the nest tree. One flight by the male from an isolated cypress tree in the adjacent marsh to the nest tree was abruptly aborted, apparently in response to our presence at a distance of ~200 ft from the nest tree. No eagle activity was observed during the second visit on 9 April 2021. On the third and final visit on 12 April 2021, a fledging was observed moving and extending its wings above the edge of the nest. Therefore, it can be concluded that the nest is active with at least one eaglet.

Habitat Description for Eagle Nest Tree Location

The nest site is a linear upland feature on the tidal floodplain of the Cape Fear River. The associated plant community is a relatively natural coastal fringe evergreen forest with an open canopy of loblolly pine (*Pinus taeda*), sand laurel oak (*Quercus hemisphaerica*), magnolia (*Magnolia grandiflora*), and sweetgum (*Liquidambar styraciflua*). Scattered understory trees include American beech (*Fagus grandifolia*) and American holly (*Ilex opaca*). The moderately dense shrub layer is dominated by American holly, witch-hazel (*Hamamelis virginiana*), blueberry (*Vaccinium* sp.), wild olive (*Osmanthus americanus*), and dwarf paw paw (*Asimina parviflora*). The groundcover stratum is dominated by sparse woody vines such as muscadine (*Vitis rotundifolia*) and greenbrier (*Smilax* sp.).

Past Activity at Element Occurrence

Based on the NC Natural Heritage Program (NCNHP) Element Occurrence (EO) record (# 27956), two nest trees, including the existing nest tree cited above and an older additional tree at the site that is not present today, have historically been used by bald eagles. The EO record includes the following incomplete annual nest survey data: active nest 2008-2009 (D. Allen NCWRC), no survey 2011-2012, and inactive nest 2015 (Carpenter NCWRC 2018-2019). As shown in Figure 1, the larger circle indicates the present active nest and the very small one, the location of the historic nest tree.

Conclusion

Based on the presence of an active bald eagle nest within the survey area, consultation with the USFWS pursuant to the Eagle Act will be required for the proposed project. If it is determined that the project will result in the take of eagles (disturbance, injury, or killing) or an eagle nest (removal, relocation, or destruction), an incidental take permit or nest take permit will be required, respectively.

Regards,

DIALCORDY AND ASSOCIATES INC.

R Steve Dial

R. Steve Dial
President

cc. J21-1460

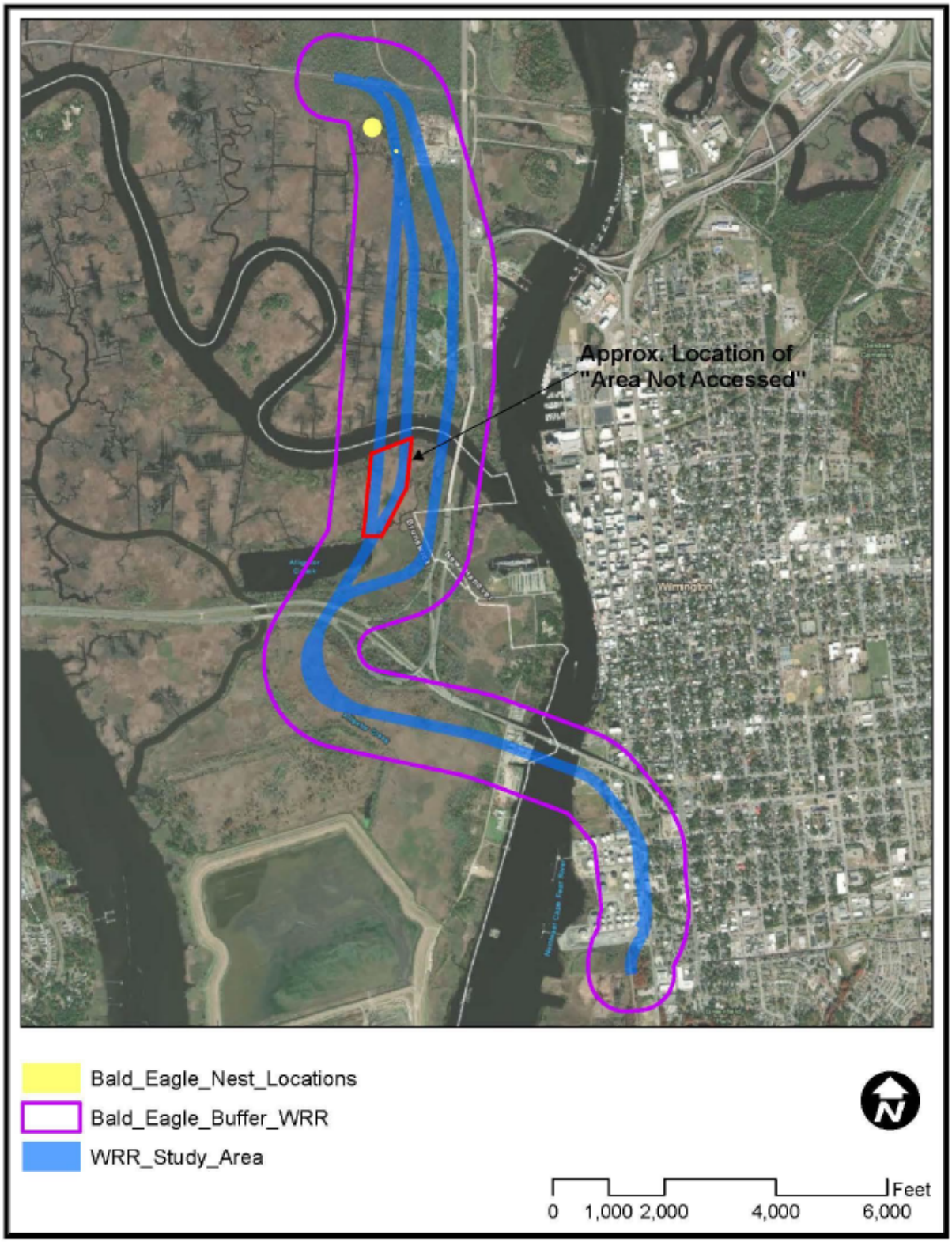

Figure 1. City of Wilmington Rail Realignment Study Area and Bald Eagle Buffer Area.

Photograph 1. Bald Eagle Active Nest Tree.

Photograph 2. Close up of Bald Eagle Nest in Loblolly Pine.

UNITED STATES DEPARTMENT OF COMMERCE
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06/21/2022

F:SER31/AH

Mr. Brandon Bratcher
U.S. Department of Transportation
Federal Railroad Administration
1200 New Jersey Avenue, SE
Washington, DC, 20590

Attention: Kevin Wright

Re: Wilmington Rail Realignment

Dear Mr. Bratcher:

NOAA's National Marine Fisheries Service (NMFS) participated in a teleconference on January 18, 2022, with representatives from the Federal Railroad Administration (FRA), WSP USA, AECOM, and Dial Cordy Associates Inc. to discuss Magnuson-Stevens Fishery Conservation and Management Act (MSA) and Endangered Species Act (ESA) consultations on the Wilmington Rail Realignment. During the call, NMFS was provided an overview of the project, which proposes to reroute the existing freight traffic from the CSXT Beltline in the city of Wilmington to a new freight line across the Cape Fear River and Eagles Island in New Hanover and Brunswick Counties, NC. The FRA and NMFS agreed that because the project's current scope includes only preliminary engineering, up to 30% design, the level of detail available will be insufficient to conduct a thorough ESA Section 7 consultation. Therefore, FRA and NMFS agreed ESA Section 7 consultation should be deferred to the project's final phase of engineering design. NMFS also confirmed our role as a cooperating agency and our intention to provide robust technical assistance throughout the preceding design phases, to help avoid, minimize, and mitigate potential impacts to NOAA trust resources.

In a June 2, 2022, letter, the FRA provided NMFS additional information on the project, consistent with our role as a cooperating agency and our intention to provide robust technical assistance. That letter also requested NMFS provide a letter confirming FRA's deferral of Section 7 consultation to the final engineering design phase. NMFS supports the FRA's decision to postpone ESA Section 7 consultation to the final phase of engineering design. We look forward to further coordination with you on this to ensure the conservation of marine and estuarine species and their habitats.

Sincerely,

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2022.06.21 13:44:34 -04'00'

David Bernhart
Assistant Regional Administrator
for Protected Resources

File: 1514-22cc.

cc: F/SER3, Bernhart, Farmer, Shotts, Herndon
F/SER4, Wilber, Rohde

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
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08/04/2022

F:SER/BR

Mr. Brandon Bratcher
U.S. Department of Transportation
Federal Railroad Administration
1200 New Jersey Avenue, SE
Washington, DC, 20590

Attention: Kevin Wright

Re: Wilmington Rail Realignment

Dear Mr. Bratcher:

NOAA's National Marine Fisheries Service (NMFS) has reviewed the Draft Environmental Assessment (EA) and the Essential Fish Habitat (EFH) Assessment (Appendix D) for the Federal Railroad Authority's (FRA) proposed Wilmington Rail Realignment Project. We conducted our review as a cooperating agency and as a consulting agency under the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and Endangered Species Act (ESA). General comments on the Administrative Draft EA and EFH assessment are provided in the following sections.

Project Description

The City of Wilmington (City) is proposing to reroute existing freight traffic from the CSX Transportation Inc. (CSX) Beltline to a new freight line approximately four miles in length crossing the Cape Fear River and traversing Eagles Island in New Hanover and Brunswick Counties, North Carolina. The proposed bypass would improve freight rail operations, regional mobility, and public safety by providing an alternate route with a more direct connection to the Port of Wilmington.

Previous & Ongoing Coordination

The Federal Railroad Administration (FRA) and NMFS previously agreed that because the project's scope included only preliminary engineering, up to 30% design, the level of detail available will be insufficient to conduct a thorough ESA Section 7 consultation. Therefore, FRA and NMFS agreed ESA Section 7 consultation should be deferred to the project's final phase of engineering design. NMFS also confirmed our role as a cooperating agency and our intention to provide robust technical assistance throughout the preceding design phases to help avoid, minimize, and mitigate potential impacts to NOAA trust resources.

In a June 2, 2022, letter, the FRA provided NMFS additional information on the project, consistent with our role as a cooperating agency and our intention to provide robust technical assistance. That letter also requested NMFS provide a letter confirming FRA's deferral of Section 7 consultation to the final engineering design phase. NMFS supported the FRA's decision to initiate ESA Section 7 consultation during the final phase of engineering design.

Initiation of Section 7 consultation during the final engineering design phase of the project affects completion of the EFH consultation under the MSA. Surface transportation projects covered by the Fixing America's Surface Transportation Act (FAST Act) are posted to the federal Permitting Dashboard

(permits.performance.gov), an online tool for Federal agencies, project sponsors, and interested members of the public to track the Federal government's environmental review and authorization process for large or complex infrastructure projects.

It is unclear whether or not the FRA intends to publish our EFH and ESA consultation timelines to the Permitting Dashboard. Presently, the Wilmington Rail Realignment Project tracks the completion of both the EA and the National Historic Preservation Act of 1966 (NHPA) Section 106 consultation. If deferred to the final engineering design phase of the project, completion of the ESA consultation would occur outside of the window encompassed by the EA timeline making it unnecessary to track its completion on the Permitting Dashboard.

It is NMFS agency policy to align EFH and ESA timelines to the extent practicable to provide more unified communications to action agencies and promote cross-divisional collaboration on complex infrastructure projects. Due to the differing lengths of time necessary to conduct our EFH and ESA consultations from the point of initiation (typically 60 days versus 135 days, respectively), we strive to align the first two milestones (date for "request for consultation received" and date for "consultation package deemed complete").

We propose postponing completion of the EFH consultation under the MSA until the final phase of engineering design. Our intention is to ensure the ESH and ESA consultations are conducted concurrently while reducing the likelihood of needing to re-initiate either consultation at a later date. We remain committed to supporting the FRA through the environmental review process by providing technical assistance during pre-planning stages to help avoid, minimize, and mitigate potential impacts to resources.

Magnuson-Stevens Fishery Conservation and Management Act

The EFH Assessment adequately describes fishery habitat (estuarine emergent wetlands, unconsolidated bottom, and submerged aquatic vegetation) and Habitat Areas of Particular Concern (HAPCs) (primary nursery areas) and associated managed species. Direct and indirect impacts will occur in these habitats. The current level of design does not allow for a complete analysis of potential impacts, for example, acoustic impacts on fishes during construction. Typically, an environmental window is established to avoid these impacts. Impacts from sedimentation suspension during construction would degrade water quality but are expected to be localized. The preliminary project design has included several measures to avoid or minimize impacts to EFH or HAPC, particularly the elevation of the rail line through wetlands. The FRA will continue to coordinate with NMFS through the process to develop additional avoidance and minimization measures to EFH/HAPC.

Endangered Species Act (Section 7)

On page 3-108, the statement regarding the Biological Assessment which reads: "a Biological Assessment may be required during the Section 7 consultation with NMFS to assess impacts that may result from the Project to shortnose and Atlantic sturgeon, and the Atlantic sturgeon designated critical habitat…." should be revised. A complete Biological Assessment is required to initiate Section 7 consultation; the word may should be replaced with shall.

General NEPA Comments

Table S-1: Summary of Potential Impacts (page ES-9 through ES-12) - This table accurately identifies potential impacts and proposed mitigation strategies for impacts to threatened and endangered species. It does not, however, identify impacts and proposed mitigation to other biological resources (i.e., fisheries

stocks occurring in the project area managed under the MSA which are not listed as either threatened or endangered species under the ESA). Section 3.15 indicates potential impacts and mitigation strategies for EFH resulting from the Project will be addressed with consultation under the MSA. We suggest inserting another row to Table S-1 between "Threatened and Endangered Species" and "Soil and Farmland" entitled "Anadromous Species" for identification and description of impacts and proposed mitigation to other species managed under the authority of the Fish and Wildlife Coordination Act (*16 U.S.C. §§ 661–666c*).

Section 3.24 Indirect and Cumulative Impacts - It is unclear if the FRA anticipates an increase in vessel calls to the Port of Wilmington as a result of the rail realignment. Such an increase would need to be accounted for in the cumulative impacts section of the EA as the increased vessel traffic to and from the Port has the potential to affect threatened and endangered species (vessel strikes, etc.) and also warrants consideration in your effects analysis for the Biological Assessment.

Conclusion

We appreciate your coordination with our office on this project. If you have any additional questions regarding the comments provided above, please do not hesitate to contact us. For questions pertaining to essential fish habitat and/or the MSA, please contact Mr. Fritz Rohde by email at fritz.rohde@noaa.gov. For questions pertaining to protected species and/or the ESA, please contact Mr. Andrew Herndon by email at andrew.herndon@noaa.gov.

Sincerely,

AMENDOLA.KIMBERLY.BARBARA.1365830769 Digitally signed by AMENDOLA.KIMBERLY.BARBARA.1365830769 Date: 2022.08.04 05:14:43 -04'00'

for Andrew J. Strelcheck
Regional Administrator

cc:
F, Chabot, Youngkin
F/SER: Strelcheck, Amendola, Blough, Silverman, Rosegger
F/SER3, Bernhart, Farmer, Shotts, Herndon
F/SER4, Fay, Wilber, Rohde

United States Department of the Interior
FISH AND WILDLIFE SERVICE
Raleigh ES Field Office
551-F Pylon Drive
Raleigh, North Carolina 27606

September 8, 2022

Kevin Wright
US DOT- Federal Railroad Administration
1200 New Jersey Avenue, SE
Washington, DC 20590

Re: City of Wilmington Rail Realignment – Brunswick and New Hanover Counties

Dear Mr. Wright:

This letter is to inform you that the Service has established an on-line project planning and consultation process which assists developers and consultants in determining whether a federally-listed species or designated critical habitat may be affected by a proposed project. For future projects, please visit the Raleigh Field Office's project planning website at https://www.fws.gov/office/eastern-north-carolina/project-planning-and-consultation. If you are only searching for a list of species that may be present in the project's Action Area, then you may use the Service's Information, Planning, and Consultation System (IPaC) website to determine if any listed, proposed, or candidate species may be present in the Action Area and generate a species list. The IPaC website may be viewed at https://ipac.ecosphere.fws.gov/. The IPaC web site contains a complete and frequently updated list of all endangered and threatened species protected by the provisions of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.)(Act), a list of federal species of concern[1] that are known to occur in each county in North Carolina, and other resources.

Section 7 of the Act requires that all federal agencies (or their designated non-federal representative), in consultation with the Service, ensure that any action federally authorized, funded, or carried out by such agencies is not likely to jeopardize the continued existence of any federally-listed endangered or threatened species. A biological assessment or evaluation may be prepared to fulfill that requirement and in determining whether additional consultation with the Service is necessary. In addition to the federally-protected species list, information on the species' life histories and habitats and information on completing a biological assessment or

[1] The term "federal species of concern" refers to those species which the Service believes might be in need of concentrated conservation actions. Federal species of concern receive no legal protection and their designation does not necessarily imply that the species will eventually be proposed for listing as a federally endangered or threatened species. However, we recommend that all practicable measures be taken to avoid or minimize adverse impacts to federal species of concern.

evaluation and can be found on our web page at https://fws.gov/office/eastern-north-carolina. Please check the web site often for updated information or changes.

If your project contains suitable habitat for any of the federally-listed species known to be present within the county where your project occurs, the proposed action has the potential to adversely affect those species. As such, we recommend that surveys be conducted to determine the species' presence or absence within the project area. The use of North Carolina Natural Heritage program data should not be substituted for actual field surveys.

If you determine that the proposed action may affect (i.e., likely to adversely affect or not likely to adversely affect) a federally-protected species, you should notify this office with your determination, the results of your surveys, survey methodologies, and an analysis of the effects of the action on listed species, including consideration of direct, indirect, and cumulative effects, before conducting any activities that might affect the species. If you determine that the proposed action will have no effect (i.e., no beneficial or adverse, direct or indirect effect) on federally listed species, then you are not required to contact our office for concurrence (unless an Environmental Impact Statement is prepared). However, you should maintain a complete record of the assessment, including steps leading to your determination of effect, the qualified personnel conducting the assessment, habitat conditions, site photographs, and any other related articles.

With regard to the above-referenced project, we offer the following remarks. Our comments are submitted pursuant to, and in accordance with, provisions of the Endangered Species Act.

Based on the information provided and other information available, it appears that the proposed action is not likely to adversely affect any federally-listed endangered or threatened species, their formally designated critical habitat, or species currently proposed for listing under the Act at these sites. We believe that the requirements of section 7(a)(2) of the Act have been satisfied for your project. Please remember that obligations under section 7 consultation must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered; (2) this action is subsequently modified in a manner that was not considered in this review; or, (3) a new species is listed or critical habitat determined that may be affected by the identified action.

However, the Service is concerned about the potential impacts the proposed action might have on aquatic species. Aquatic resources are highly susceptible to sedimentation. Therefore, we recommend that all practicable measures be taken to avoid adverse impacts to aquatic species, including implementing directional boring methods and stringent sediment and erosion control measures. An erosion and sedimentation control plan should be submitted to and approved by the North Carolina Division of Land Resources, Land Quality Section prior to construction. Erosion and sedimentation controls should be installed and maintained between the construction site and any nearby down-gradient surface waters. In addition, we recommend maintaining natural, vegetated buffers on all streams and creeks adjacent to the project site.

The North Carolina Wildlife Resources Commission (NCWRC) has developed a Guidance Memorandum (found at https://www.ncwildlife.org/Conserving/Learn-Resources/Ways-to-Conserve) to address and mitigate secondary and cumulative impacts to aquatic and terrestrial

wildlife resources and water quality. We recommend that you consider this document and the NCWRC's other conservation recommendations in the development of your projects and in completing an initiation package for consultation (if necessary).

We hope you find our web page useful and informative and that following the process described above will reduce the time required, and eliminate the need, for general correspondence for species' lists. If you have any questions or comments, please contact John Ellis of this office at (919) 856-4520 ext. 26.

Sincerely,

John Ellis for

Pete Benjamin

Field Supervisor

APPENDIX G: NOISE AND VIBRATION TECHNICAL MEMORANDUM

Wilmington Rail Realignment

Noise and Vibration

Technical Memorandum

PREPARED FOR:

FEDERAL RAILROAD ADMINISTRATION AND

THE CITY OF WILMINGTON

PREPARED BY:

AECOM

JUNE 2023

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1 NOISE AND VIBRATION OVERVIEW AND SUMMARY OF RESULTS

1.1 NOISE AND VIBRATION OVERVIEW

The City of Wilmington (City), in coordination with the Federal Railroad Administration (FRA) (Lead Federal Agency) is proposing to reroute through freight traffic from the existing CSX Transportation (CSXT) freight rail line, commonly referred to as the "Beltline" by constructing a new rail connection between the Port of Wilmington and CSX's Davis Yard in the Town of Navassa (Project). The proposed bypass would create an approximately 4-mile new freight rail alignment that would improve freight rail operations, regional mobility, and public safety (Figure 1).

The Preferred Alternative for the Project, as shown in Figure 2, creates a bypass for the existing freight traffic serving the Port of Wilmington from the Beltline through the City to a new freight rail line that crosses the Cape Fear River and traverses Eagles Island to reconnect with the existing CSXT line to Davis Yard (Figure 2). Under the Preferred Alternative, the Beltline remains in place and limited freight service could continue to operate over the Beltline to serve local industries.

A comprehensive noise and vibration study was conducted in accordance with the Federal Transit Administration's (FTA) *Transit Noise and Vibration Impact Assessment Manual* (Manual)[1] to assess the potential for impact from various sources of the Project. Although the lead Federal agency for the Project is the FRA, the FTA Manual is used for projects with conventional train speeds below 90 miles per hour (mph). The FRA's High-Speed Ground Transportation Noise and Vibration Impact Assessment manual is used for high-speed ground transportation projects with train speeds of 90-250 mph.[2] This technical report describes the existing noise and vibration environment in the Project Study Area (as defined in the Environmental Assessment), identifies Project-related noise and vibration levels that would result from the Preferred Alternative, discusses the temporary impacts that could occur during construction, describes measures that have been incorporated into the design to reduce Project-related noise and vibration, and discusses potential minimization and mitigation measures to address impacts. The outline of this report follows the FTA Manual in Section 8.2.

[1] Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, FTA Report No. 0123, Washington, DC, September 2018

[2] Federal Railroad Administration, *High-Speed Ground Transportation Noise and Vibration Impact Assessment*, DOT/FRA/ORD-12/15, Washington, DC, September 2012.

Figure 1: Project Study Area

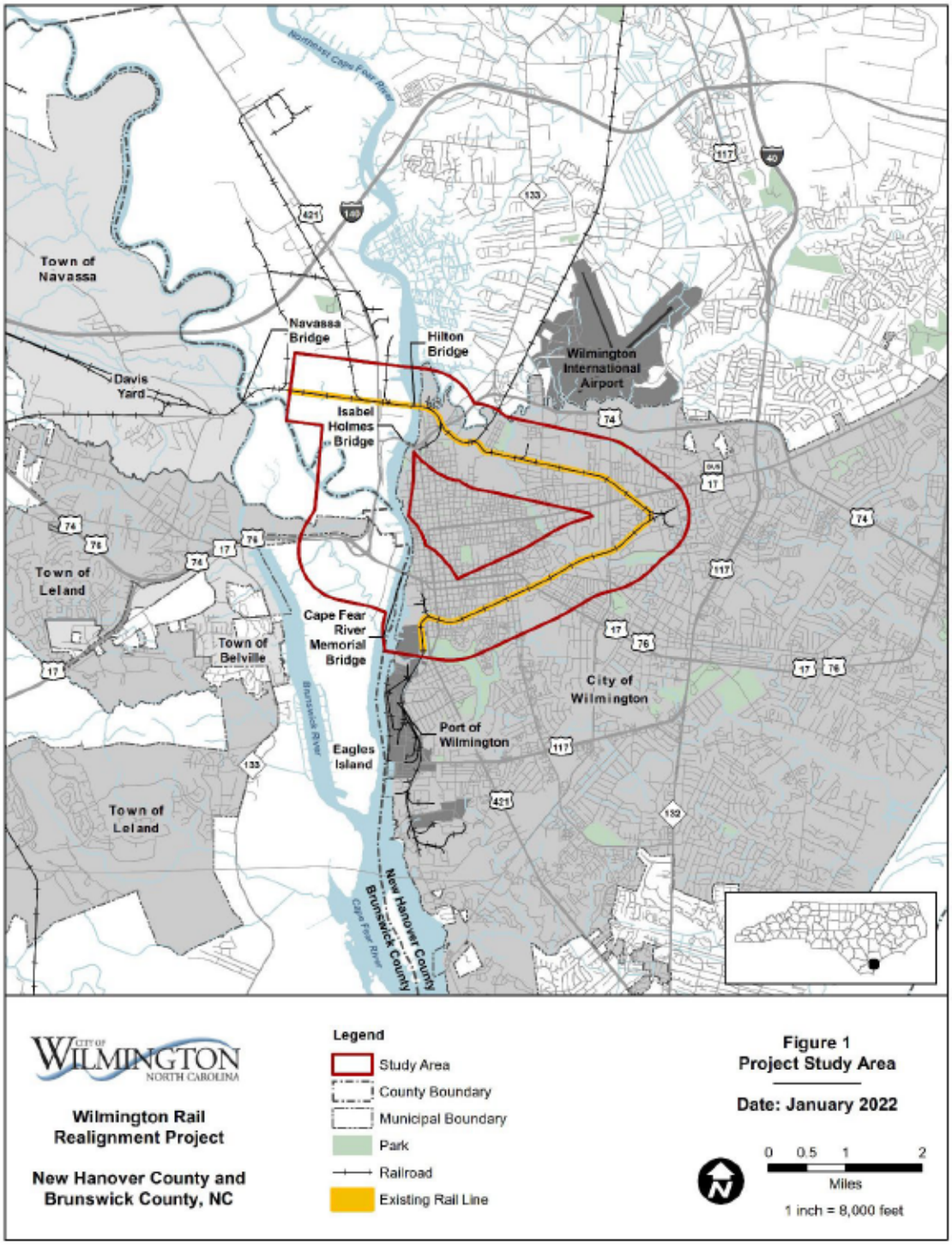
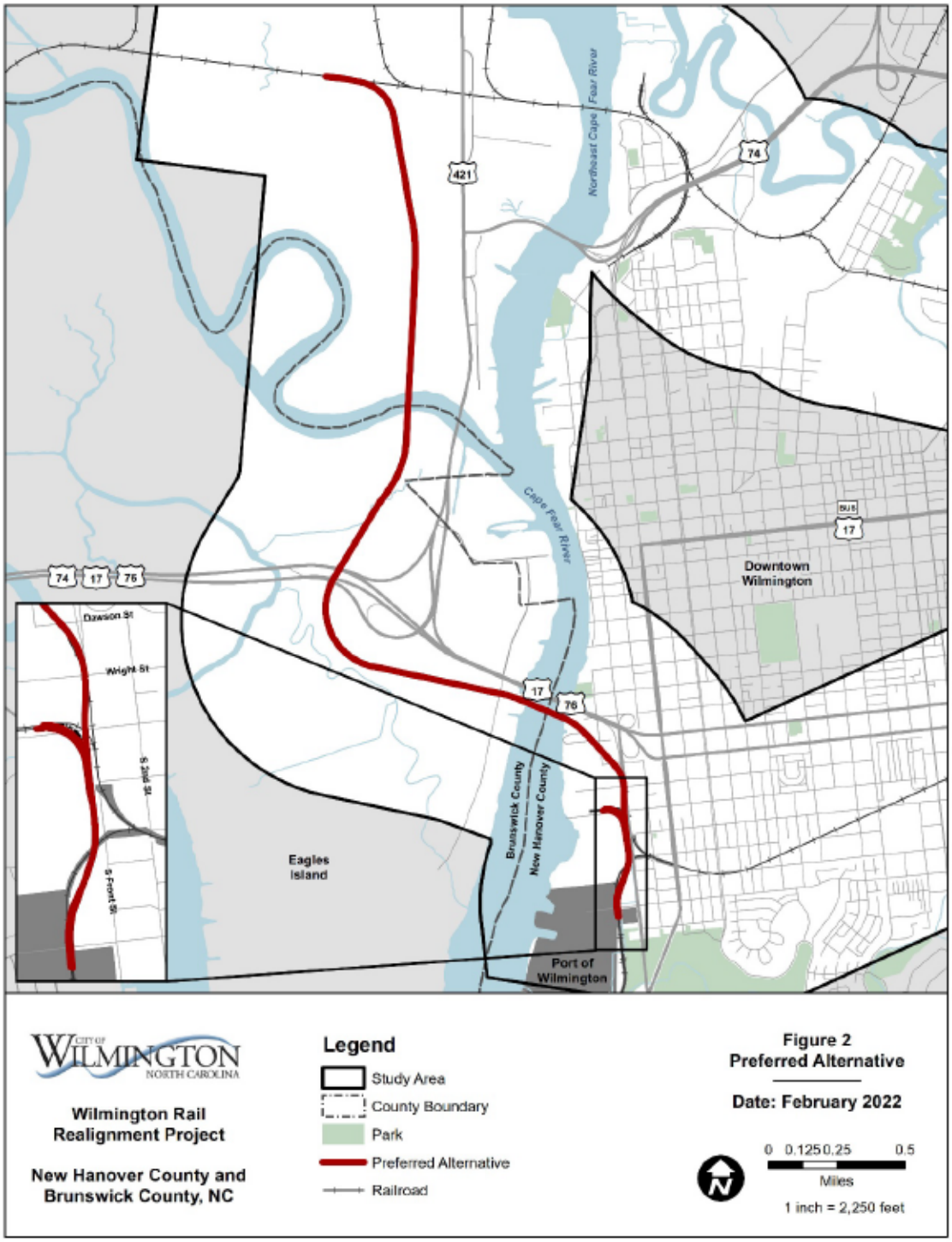


Figure 2: Preferred Alternative



Since the Surface Transportation Board (STB) is a cooperating agency on this project, the applicability of the 49 CFR 1105 Procedures for Implementation of Environmental Laws was considered. Overall, the agency has jurisdiction over railroad rate, practice, and service issues and rail restructuring transactions, including mergers, line sales, line construction, and line abandonments. However, the STB evaluation criteria are intended for a more general assessment of large-scale corridors whereas the FTA guidance was specifically developed for these types of projects. Therefore, since the FTA guidance addresses the assessment of noise impacts from freight rail projects in much greater depth and detail than the STB procedures, the STB procedures were not directly applied to the Project. However, as with all other freight and non-freight rail NEPA projects, application of the FTA guidance more that satisfies the intent and purpose of the STB requirements set forth by 49 CFR §1105.7(e)6 *Noise*.

One of the primary benefits of the proposed Project would be the substantial decrease of freight rail service along the current Beltline that passes through dense residential communities. Due to the 32 at-grade crossings along the Beltline, train warning horns are currently sounded at each grade crossing resulting in adverse noise effects at 1,500 residences particularly during the nighttime period. The proposed Project will allow freight train operators to bypass the circuitous Beltline route in favor of the much shorter route along the Cape Fear River thereby reducing travel times from approximately 1 hour to approximately 30 minutes. This time savings alone would incentivize freight rail operators to utilize the new bypass route and avoid the Beltline with the exception of occasional trips to service their commercial customers that are located along the Beltline.

Relocating freight rail service away from dense residential communities along the Beltline, including large portions of the Wilmington Historic District, to primarily uninhabited areas along Eagles Island and west of South Front Street would reduce the adverse noise effects on residents are currently experiencing by over 96 percent. This significant decrease in noise is achieved by minimizing the need to sound train warning horns within 15-20 seconds of public grade crossings from 32 locations along the Beltline to only one consolidated train horn noise event at two adjacent crossings at Wright and Dawson Streets.

Initial noise modeling indicates there would be noise impacts to residences near the proposed Wright and Dawson Streets at-grade crossings, including some contributing resources to the Wilmington Historic District. Control measures are therefore required to mitigate these impacts. Identified mitigation measures consist of grade crossing closure or controlled access through road closures or road realignments which would eliminate the need for sounding of train warning horns at these grade crossings, thereby mitigating all Project noise impacts.

Due to the relocated alignment of the railroad to west of South Front Street adjacent to the fuel storage facility, the bypass alignment is not predicted to result in any ground-borne vibration impacts above the existing levels already experienced at nearby residences and businesses (such as the winery restaurant on South Front Street). Also, noise and vibration from temporary

construction activities are not expected to exceed the FTA impact criteria except for one residence at 1105 South Front Street (not historic) only 135 feet from track grading activities.

1.2 Summary of Results

In summary, the noise and vibration analysis indicate that the Project will result in a significant reduction of noise effects on residents by over 96 percent, does not introduce new permanent noise or vibration impacts with mitigation, and results in temporary noise and vibration impacts at one residence.

2 METHODOLOGY AND INVENTORY OF RECEPTORS

2.1 RECEPTOR SCREENING PROCEDURE

The FTA screening procedures were utilized to broadly select receptor sites within the Project Study Area with the potential for noise and vibration impacts. Noise and vibration sensitive receptors include those locations that could be adversely affected by rail operations such as residences, schools, libraries, churches and parks. The FTA land use categories and noise metrics are described in Table 1.

Table 1: FTA Land Use Categories and Noise Metrics

Land Use Category	Noise Metric	Description
1	$L_{eq}(h)$	Tracts of land set aside for serenity and quiet, such as outdoor amphitheaters, concert pavilions and historic landmarks.
2	L_{dn}	Buildings used for sleeping such as residences, hospitals, hotels and other areas where nighttime sensitivity to noise is of utmost importance.
3	$L_{eq}(h)$	Institutional land uses with primarily daytime and evening uses including schools, libraries, churches, museums, cemeteries, historic sites and parks, and certain recreational facilities used for study or meditation.

Notes: L_{dn} describes a receiver's cumulative noise exposure from all events over a full 24 hours, with events between 10:00 p.m. and 7:00 am increased by 10 decibels to account for greater nighttime sensitivity to noise. For other noise sensitive land uses, such as schools and libraries (FTA Land Use Category 3) and outdoor amphitheaters (FTA Land Use Category 1), the average hourly equivalent noise level (or $L_{eq}(h)$) is used to represent the peak operating period.

Source: FTA *Manual*.

Other land-uses along the bypass include transportation, commercial and industrial facilities (e.g., petroleum storage and distribution), undeveloped lands and wildlife areas as part of the Eagles Island. However, the FTA does not consider commercial and industrial land-uses sensitive to rail noise. Additionally, the FTA Manual also does not address noise and vibration effects on wildlife and domestic animals. Although the FRA High-Speed manual provides a limited approach to addressing potential impacts to wildlife, these effects are related to the shock effects of high-speed trains rather than conventional trains with much lower speeds. Therefore, there is no approved FTA methodology or guidelines for reliably assessing noise and vibration impacts on animals and wildlife.

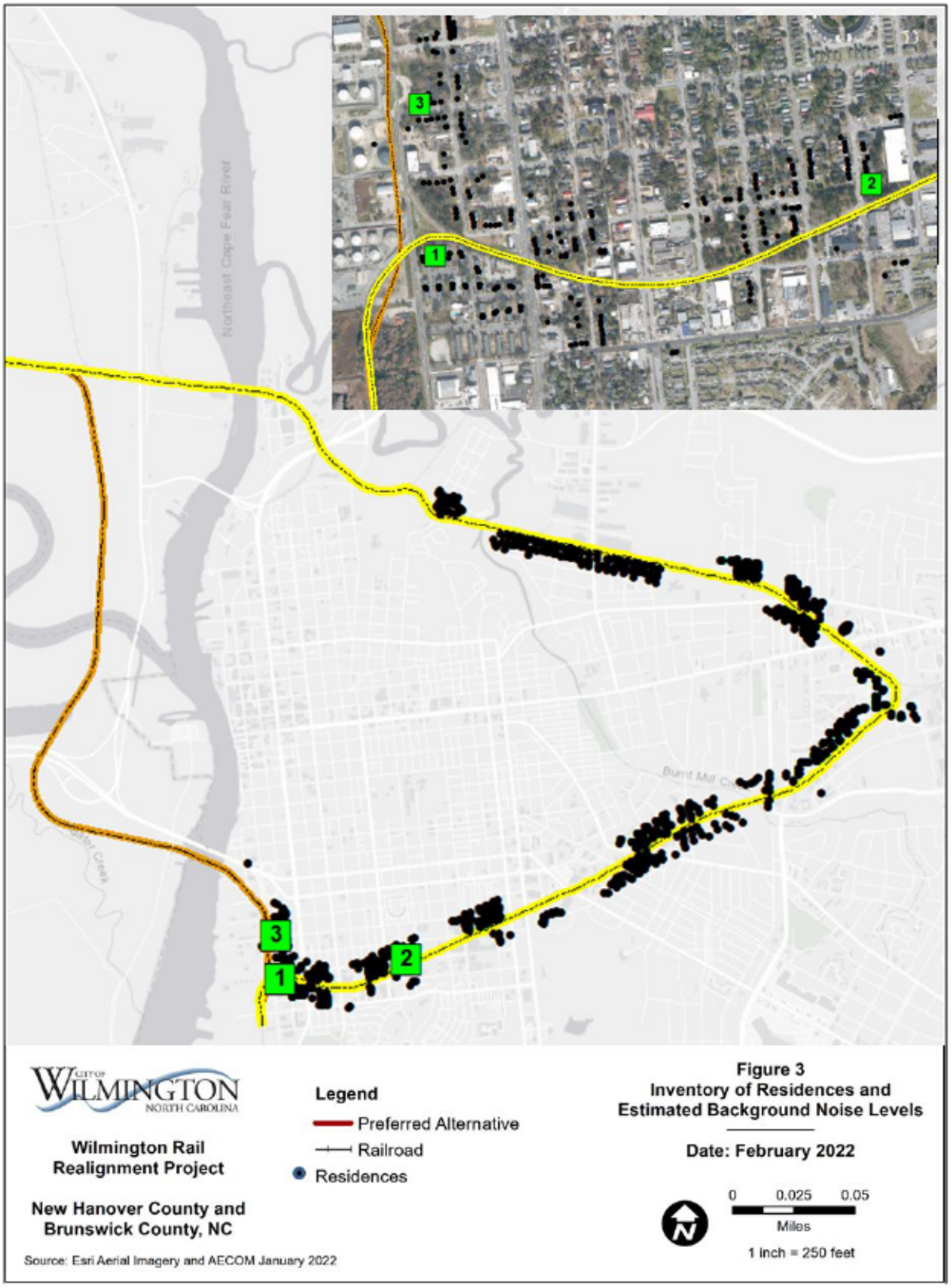
Using FTA Manual Table 4-7 for noise and Table 6-8 for vibration, the default screening distances were adjusted to reflect Project-specific sources and operating conditions. The screening distance for both noise and vibration was conservatively set at 500 feet from the proposed railroad centerline to include significantly more instead of fewer properties. Using graphical information system (GIS) software, aerial maps, and parcel data provided by New

Hanover County, over 2,000 receptors were identified for the technical analysis (Figure 3)[3]. All eligible sensitive receptors are residential and no other noise-sensitive receptors were identified within the Project screening distance.

Under the Preferred Alternative, train operations would be rerouted from the Beltline to a new rail bypass farther away from dense residential communities. Three representative receptor areas were selected to show the overall effects of the Project: (1) the east side of the Cape Fear River along South Front Street near the wye and the junction of the existing corridor and the bypass alignment; (2) in the City of Wilmington along the existing Beltline communities where there would be a substantial reduction in noise; and (3) south of downtown Wilmington along South Front Street adjacent to the new bypass alignment approaches the port area (Figure 3). These three representative receptors were selected to show the benefits and effects of the proposed Project more succinctly than a discussion of all 2,024 receptors included in the modeling analysis. There were no residences or other noise-sensitive receptors identified in Brunswick County west of the Cape Fear River, so that area is not discussed further.

[3] New Hanover County GIS Portal, https://maps.nhcgov.com.

Figure 3: Inventory of Residences and Estimated Background Noise Levels



2.2 Noise and Vibration Level Prediction Methodology

Operational noise levels from freight rail operations in the Project Study Area were predicted using the Detailed Noise Analysis procedures, methodologies and algorithms included in Section 4.5 of FTA's Manual. Additionally, separate noise levels or adjustments were also determined for train warning horns, switches and jointed-rail track.

Detailed data on freight rail operations is typically difficult to define with precision since freight rail operations are highly aligned with economic and market conditions; however, the following freight operating conditions were utilized to estimate Project impacts based on preliminary operations data for both the existing condition and the Preferred Alternative[4]. As shown in Table 2, these two future freight scenarios are not a result of the Project and would occur over the Beltline regardless of whether the Project is implemented or not.

Table 2: Existing and Future Freight Rail Operations

Condition	Scenario	Round Trips	Train Length (ft)	Locomotives	Railcars	Speed (mph)	Trips[1] (day/night)	Railcar-miles per day
Existing	--	1	6,000	2	100	10	0 / 2	1,628
Future	1	2	10,000	2	150	25	3 / 1	2,430
	2	3	6,000	2	100	25	5 / 1	2,430

1 The number of daily trips include both daytime and nighttime operations, respectively.
Source: AECOM, April 2023.

This information was used to calculate total daily noise exposure over a 24-hour period at the selected residences. Noise levels were adjusted to reflect each receptor's distance, changes in rail vehicle speeds, rail gaps at switches and ground attenuation. Shielding effects from existing structures that reduce noise transmission due to the elevated track structure are not applicable since most of the elevated track would be along remote regions without any nearby receptors.

Other adjustments (noise increases) were applied for turnout switches, jointed-rail track, and train warning horns. Two track turnout switches are proposed along the bypass alignment along South Front Street near Marstellar Street where it connects with the existing Beltline alignment and an industrial spur to the Colonial Fuel Storage property. A 10-decibel adjustment was applied for rail vehicle passbys over switches to reflect the rail discontinuities associated with the switch points and frogs. A 5-decibel adjustment was applied for increased noise due to jointed-rail track. Additionally, the train warning horns would be sounded for 20 seconds upon approach of all public grade crossings in accordance with FRA requirements for public crossings.[5] Although the train warning horns are not required at private driveways, such as those accessing the industries west of South Front Street, they are required at public roadway

[4] AECOM, WRR Operations Analysis NCSPA Edits 11_24_21 - Draft Final.docx, November 2021.
[5] 49 CFR Part 222, Use of Locomotive Horns at Public Highway-Rail Grade Crossings, August 17, 2006.

crossings. As a conservative assumption for the noise assessment, train warning horn use was assumed at two grade crossings proposed along the bypass alignment at Wright and Dawson Streets. Due to the close configuration of these roads, the train warning horn at these locations was treated as one event.

Vibration levels from future freight rail operations were predicted using the General Vibration Assessment procedures, methodologies and algorithms included in Section 6.4 of the FTA's Manual. Unlike noise, however, vibration levels are determined for single events such as a locomotive passby rather than the cumulative exposure over a 24-hour period. Using the Ground-Surface Vibration Curves from Figure 6-4 in the FTA Manual for diesel locomotives, vibration levels were determined for freight rail passbys at each receptor site. The vibration levels from the FTA default data were adjusted to reflect each receptor's distance, changes in rail vehicle speeds, rail gaps at switches and type of track structure (i.e., elevated guideway vs. at-grade). Since the locomotives are typically much heavier than railcars (220 tons compared with 110 tons for liquid tank cars), only the vibration levels from locomotives are discussed here since they would be associated with the highest vibration levels for each train passby.

2.3 Operational Criteria for Impact Assessment

Noise and vibration impacts from Project operations were assessed in accordance with the National Environmental Policy Act (NEPA) [42 U.S.C. § 4321 et seq.], the Council on Environmental Quality (CEQ) regulations [40 C.F.R. Parts 1500 -1508], and the FTA's *Manual*. The FTA's guidance Manual, particularly with respect to the assessment of impact and the annoyance criteria, are based the U.S. Environmental Protection Agency's (EPA) "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety" [Report No. 550/9-74-004, Washington DC, March 1974].

Community noise is also regulated by local noise ordinances including the "Code of Ordinances of the City of Wilmington, North Carolina", specifically Chapter 6, Article II, Section 6-26. Noise Control. However, these local ordinances generally restrict nuisance noise and set limits on when construction can occur (such as no nighttime construction between midnight and 7:00 am). They do not set any limits on the long-term operation of freight rail systems.

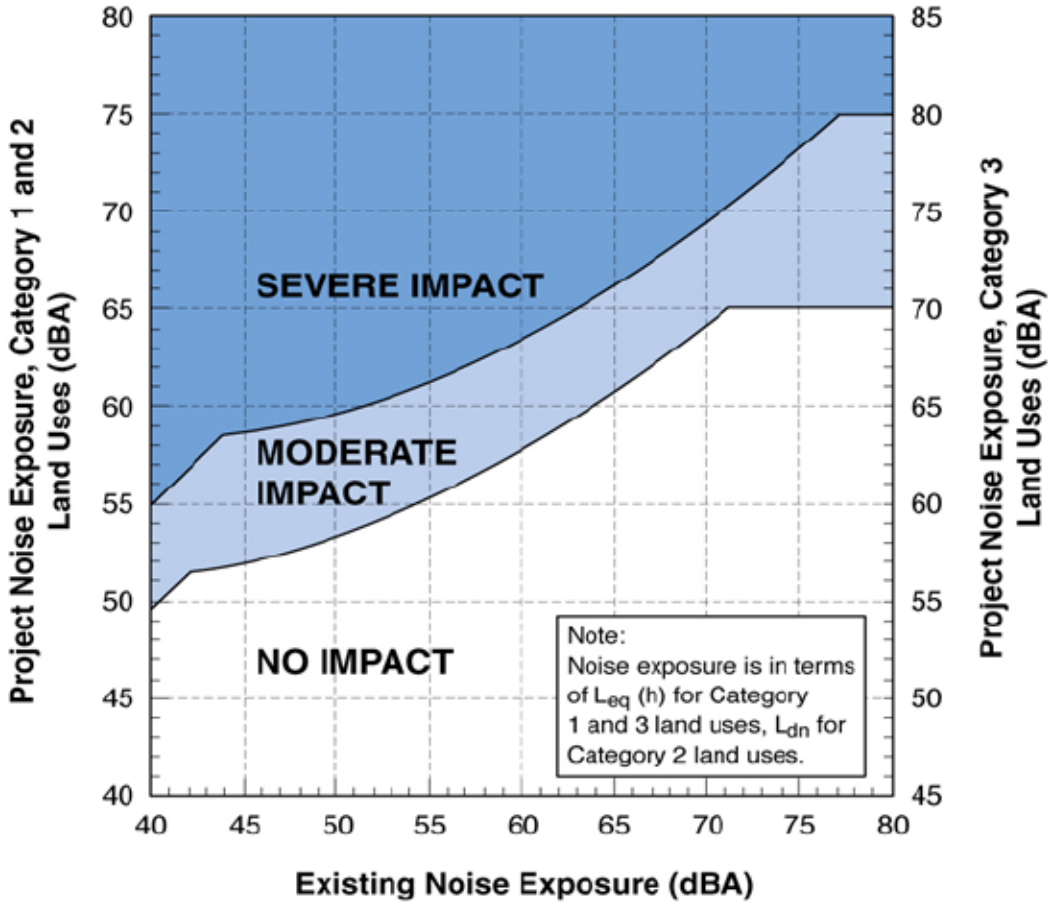
2.3.1 Noise

FTA's Manual Section 4.1 presents the basic concepts, methods, and procedures for evaluating the extent and severity of noise impacts from transit projects. Transit noise impacts are assessed based on land use categories and sensitivity to noise from transit sources under the FTA guidelines. The FTA land use categories and required noise metrics described in Table 1 include residences, schools, libraries and churches. However, residences are the primary land-use type in the Project study area and the only land uses identified within the screening distance.

As shown in Figure 4, the FTA noise impact criteria are defined by two curves that allow increasing Project noise levels as existing noise increases up to a point, beyond which impact is determined based on Project noise alone. The FTA noise criteria are delineated into two categories: *moderate* and *severe* impact. The *moderate* impact threshold defines areas where the change in noise is noticeable but may not be sufficient to cause a strong, adverse community reaction. The *severe* impact threshold defines the noise limits above which a substantial percentage of the population would be highly annoyed by new noise. The level of impact at any specific site can be determined by comparing the predicted Project noise level to the allowable noise exposure based on the existing noise level at the site.

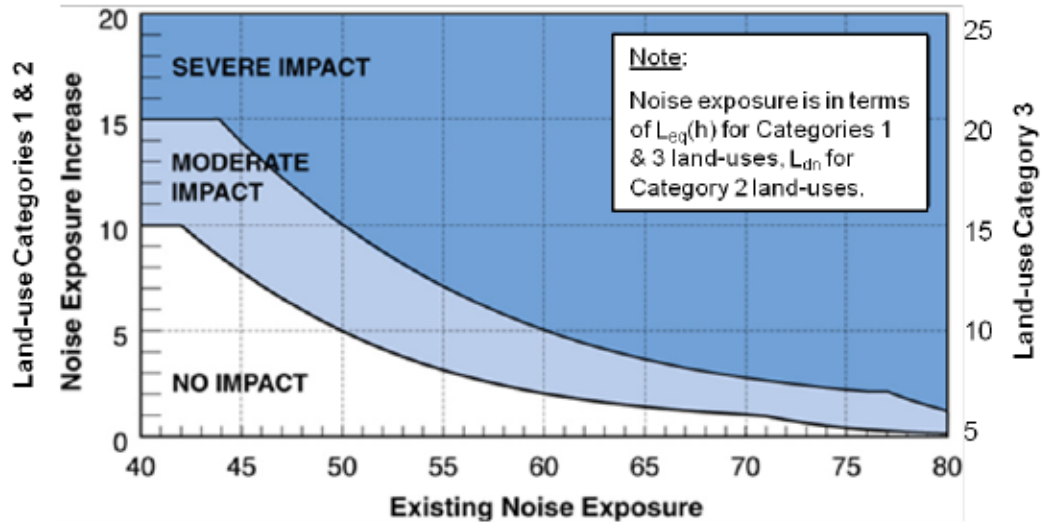
Since the existing noise will change as a result of the Project, the cumulative form of the FTA noise criteria were used to assess impact. Since the Project's noise changes are proposed to an existing rail system as opposed to a new project in an area previously without rail, the cumulative form of the criteria shown in Figure 5 were applied because it is not possible to define project noise separately from existing noise.

Figure 4: FTA Noise Impact Criteria for Transit Projects



Source: FTA Manual.

Figure 5: FTA Increase in Cumulative Noise Levels Allowed by Criteria (Land Use Cat. 2)



Source: FTA Manual.

2.3.2 Vibration

FTA's Manual Section 6.2 presents the basic concepts, methods, and procedures for evaluating the extent of vibration impacts from transit project operations. The FTA vibration criteria for evaluating ground-borne vibration impacts from rail vehicle operations at nearby sensitive receptors are shown in Table 3. These vibration criteria are related to ground-borne vibration levels that are expected to result in human annoyance and are based on root mean square (RMS) velocity levels expressed in VdB referenced to one micro inch per second. FTA's experience with community response to ground-borne vibration indicates that when there are only a few rail vehicle events per day, higher vibration levels are necessary to evoke the same community response that would be expected from more frequent events.

Table 3: Indoor Ground-Borne Vibration and Ground-Borne Noise Impact Criteria for General Vibration Assessment and Special Buildings

Land Use Category	Ground-borne Vibration			Ground-borne Noise		
	Frequent[1]	Occasional	Infrequent	Frequent	Occasional	Infrequent
Category 1: Buildings where Vibration would interfere with interior operations.	65 VdB[2]	65 VdB	65 VdB	N/A[3]	N/A	N/A
Category 2: Residences and buildings where people normally sleep.	72 VdB	75 VdB	80 VdB	35 dBA	38 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use.	75 VdB	78 VdB	83 VdB	40 dBA	43 dBA	48 dBA

1. Frequent events is defined as more than 70 vibration events of the same kind per day; Occasional events is 30-70 events per day, and; Infrequent events is fewer than 30 events per day.

2. This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research would require detailed evaluation to define the acceptable

vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.

3. Vibration-sensitive equipment is not sensitive to ground-borne noise.

Source: FTA *Manual*, Table 6-3 and Table 6-4.

This experience is taken into account in the FTA criteria by distinguishing between projects with *frequent*, *occasional*, or *infrequent* events. The *frequent* events category is defined as more than 70 events per day, the *occasional* events category is defined as between 30 and 70

events per day, and the *infrequent* events category is defined as less than 30 events per day. The FTA *infrequent* criteria were used to assess ground-borne vibration impacts in the Project Study Area due to the limited number of locomotives, which are the dominant vibration source compared to railcars. However, the FTA *frequent* criteria were used to assess ground-borne vibration impacts from railcars due to their larger numbers.

The vibration criteria levels shown in Table 5 are defined in terms of human annoyance for different land use categories such as high sensitivity (Category 1), residential (Category 2), and institutional (Category 3). In general, the vibration threshold of human perceptibility is approximately 65 VdB. No Category 1 receptors were identified in the Project Study Area.

Ground-borne noise is rarely a concern for at-grade rail systems (those not in a tunnel) because airborne noise typically dominates. Therefore, ground-borne noise (low-frequency rumble indoors) was not evaluated because no Project impacts are expected.

3 EXISTING CONDITIONS

3.1.1 Noise

In accordance with the FTA guidelines, the existing noise conditions in the Project Study Area along the existing Beltline and future bypass alignment were estimated using FTA Manual Table 4-17 (Estimating Existing Noise Exposure for General Noise Assessment) rather than measured. These baseline noise levels were updated to reflect current freight rail operations including the presence of nighttime train warning horn use in the community along the 32 at-grade crossings on the Beltline. Baseline noise measurements are generally used to determine current ambient conditions particularly for new rail corridors. However, except for potentially occasional service to commercial customers, the Project is proposing to reroute freight rail service from the existing Beltline to a bypass route that would follow an alignment west of South Front Street before crossing the Cape Fear River and heading north on Eagles Island before connecting to the existing CSXT freight rail line to Davis Yard.

Using several factors from FTA Manual Table 4-17, GIS mapping, and information on existing freight rail operations and train warning horn usage, baseline noise levels were estimated for each of the selected receptors. FTA's assessment procedure translates these factors and operating conditions into baseline noise levels that range from 60 to 75 dBA (A-weighted decibels) within the study area. Residences within approximately 120 feet of the existing rail corridor have an estimated background level of 65-75 dBA due to the nighttime freight activity. Residences beyond 120 feet from the existing rail corridor have an estimated background level of 60-65 dBA due to the larger distances from the rail.

Existing noise along the Beltline is currently dominated by train warning horn use particularly during the nighttime period. For example, 1,500 residences are currently exposed to 65 dBA L_{dn} along the Beltline due to nighttime train warning horns, which may meet or exceed FTA moderate noise impacts. The 65-dBA noise level reflects the acceptability standard selected by the U.S. Department of Housing and Urban Development (HUD) as the threshold for a normally unacceptable living environment (which is similar to a 'moderate impact' or a threshold of measurable annoyance for FTA).

Existing ambient noise levels along the bypass route are estimated to range from 45 dBA on Eagles Island to 55-60 dBA west of South Front Street due to local traffic to 65 dBA near highway Routes 17 and 74 that cross Eagles Island to 75 dBA near the wye due to existing train warning horns.

3.1.2 Vibration

Unlike noise, the existing ambient vibration is not required to assess vibration impact in most cases; but it is important to document general background vibration in the Project Study Area. Because the existing environmental vibration is usually below human perception except for

when a train passes, a limited vibration survey is sufficient even for a detailed vibration analysis. In lieu of existing vibration measurements, existing background vibration is estimated to range from less than 50 VdB (vibration decibels) or lower away from major roadways to 76 VdB at residences immediately adjacent to the existing Beltline rail corridor. The background vibration velocity level of 50 VdB is well below the threshold of perception for humans of around 65 VdB. Within buildings, operation of mechanical equipment, movement of people, or slamming of doors causes the most perceptible indoor vibration. Typical outdoor sources of perceptible vibration in the Project Study Area currently include the twice daily freight trains, traffic on local roads and any temporary construction activities.

4 ENVIRONMENTAL CONSEQUENCES

4.1 OPERATIONAL NOISE LEVELS

As shown in Table 4, future day-night operational noise levels (or L_{dn}) at the representative receptors under the Preferred Alternative for both Scenario 1 (with 10,000-foot trains) and Scenario 2 (with 6,000-foot trains) are predicted to range from 57 dBA at Site 2 (a residence at 1221 9th Street) along the existing Beltline to 63 dBA at Site 1 (multi-family residences at Laughing Oaks Lane) near the wye to 68 dBA at Site 3 (a residence at 105 Meares Street) along the bypass alignment. All the noise levels are dominated by the sounding of the train warning horn at the Wright/Dawson Street crossings.

The actual sound levels perceived by a receiver during a train passby is predicted to range from 83 dBA at the closest receiver 100' from the proposed rail corridor to 65 dBA at a receiver over 400' from the proposed rail corridor. Similarly, the sound levels perceived by a receiver during a train warning horn blast is predicted to range from 103 dBA at the closest receiver 100' from the proposed rail corridor to 85 dBA at a receiver over 400' from the proposed rail corridor.

4.2 OPERATIONAL VIBRATION LEVELS

Table 5 shows operational vibration levels at three selected representative receptors shown in Figure 3. Operational vibration levels under the Preferred Alternative are predicted to range from 40 VdB at Site 2 (a residence at 1221 9th Street) along the Beltline to 68 VdB at Site 1 (a residence at 105 Laughing Oaks Lane) near the wye to 69 VdB at Site 3 (a residence at 105 Meares Street) along the bypass alignment. To minimize potential impacts from gaps in the switch mechanism, track turnout switches are proposed over 200 feet away from residences.

Table 4: Predicted Future Day-Night Noise Levels under the Preferred Alternative, Scenarios 1 and 2

ID	Address	Land Use	FTA Cat.	Existing (dBA)	No Build (dBA)	Build 1 & 2 (dBA)	FTA Criteria		Impact Scenario 1	Impact Scenario 2
							MOD (dBA)	SEV (dBA)		
1	105 Laughing Oak Ln	RES	2	73	71-71	63-63	65	71	No	No
2	1221 9th Street	RES	2	73	71-71	57-57	65	71	No	No
3	105 Meares Street	RES	2	64	62-63	67-68	60	66	Severe	Severe

Notes: Cat. = category; MOD = moderate; RES = residence; SEV = severe

Source: AECOM, May 2023.

Table 5: Predicted Future Vibration Levels under the Preferred Alternative

ID	Address	Land-use	FTA Cat.	Existing Distance (ft)	Build Distance (ft)	Existing (VdB)	Build (VdB)	FTA Criteria (VdB)	"Infrequent" Impact
1	105 Laughing Oak Ln	RES	2	138	254	66	68	80	no
2	1221 9th Street	RES	2	141	3,400	66	40	80	no
3	105 Meares Street	RES	2	959	230	45	69	80	no

Notes: Cat. = category; and RES = residence.

Source: AECOM, May 2023.

4.3 Operational Impact Assessment Results

4.3.1 No-Build Alternative

Future noise levels under the No-Build Alternative are expected to increase due to the threefold change in rail operations from the current two trains per day to potentially six trains per day in the future. Due to the increase in train operations, receptor noise levels along the Beltline due to rail activity would reasonably be expected to increase as well particularly with the required sounding of train warning horns along most of the Beltline.

The speed of future trains is expected to increase in speed from 10 up to 25 mph; resulting in a slight decrease by up to 1-2 dBA at receptors along the Beltline. As a result, future noise effects due to train warning horns along the Beltline would also decrease by 15 to 22 percent under the No-Build Alternatives due to the change in operations and speed. For example, noise exposure of 65 dBA L_{dn} or above along the Beltline due to train warning horns would decrease from 1,499 residences under the Existing Condition to 1,168 and 1,277 sites under No-Build Alternative future operating scenarios 1 and 2, respectively.

Future vibration levels under the No-Build Alternative are expected to increase compared to the current Existing Conditions due to the change in speed from 10 up to 25 mph and the proposed threefold increase in freight rail operations. As a result, future receptor vibration levels under the No-Build Alternative along the Beltline would increase by up to 8 VdB.

4.3.2 Preferred Alternative

Under the Preferred Alternative, almost all freight rail traffic would utilize the newly created bypass and avoid the Beltline; therefore, freight operations would be farther away from the dense residential communities along the Beltline through the City. Except for the occasional freight service to commercial customers, future noise due to train warning horns along the Beltline would decrease 96 percent under the Preferred Alternative due to the rerouting of operations to the new bypass alignment. For example, the number of residences with a predicted noise exposure of 65 dBA L_{dn} or above along the Beltline due to train warning horns would decrease from 1,499 sites under the Existing Condition to 52 and 61 sites under Preferred Alternative Scenarios 1 and 2, respectively. The number of receptors under the Preferred Alternative reflect 40 new receptors adjacent to the new bypass alignment that are not currently affected by train warning horns. The reductions in rail noise would also apply to non-residential receptors such as the Forest Hills Global Elementary School along Colonial Drive and the Ebenezer Missionary Baptist Church at North 30th Street.

Future noise under the Preferred Alternative in residential communities along the Beltline would predominantly be characterized by local street traffic rather than freight rail operations. Therefore, no new noise or vibration impacts from the Preferred Alternative would be created at receptors along the Beltline. However, noise would increase slightly at residences along the

new bypass along the Cape Fear River and South Front Street. As shown in Table 4, for example, typical noise levels along the Beltline (represented by Site 2) would decrease by up to 15-16 dBA due to the elimination of regular daily freight rail traffic including the sounding of train warning horns at the 32 grade crossings. However, noise levels along South Front Street near the proposed bypass (represented by Site 3) would increase 3-4 dBA due to new freight traffic there. Noise levels at receptors near the wye (represented by Site 1) would decrease 10 dBA due to the elimination of train warning horns along the Beltline.

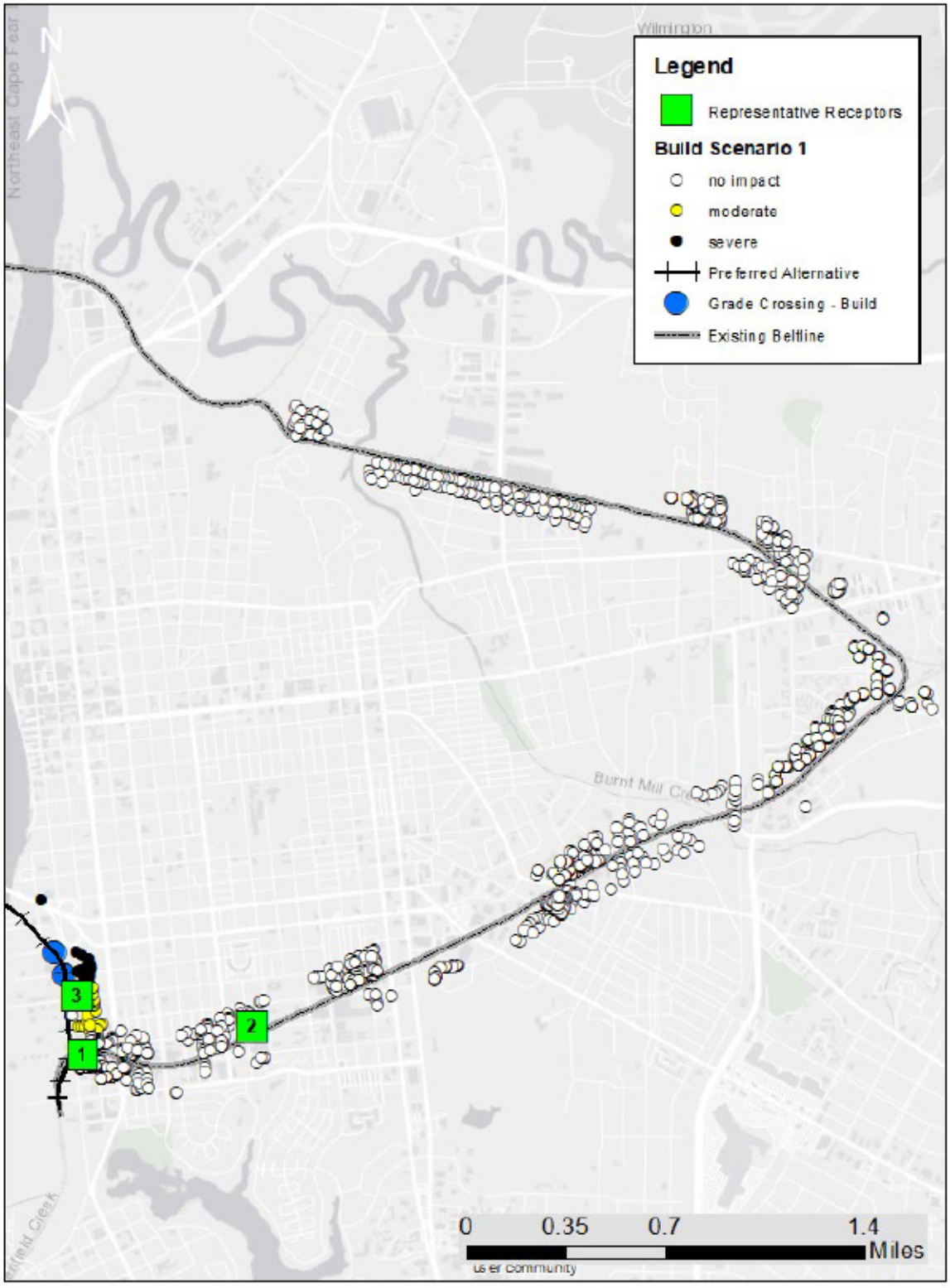
Finally, there would be no noise and vibration impacts along other portions of the new bypass route in the Brunswick County because there are no existing residences or community facilities (FTA land-use Category 3) along that portion of the Project Study Area.

4.3.3 Noise

As shown in Table 4, maximum operational noise levels at residences along the new bypass under the Preferred Alternative would be lower than the noise currently along the Beltline due to the limited use of train warning horns at grade crossings. These are the maximum Project operational noise levels that would occur in the Project Study Area. As a result, operational noise impacts (defined as future Project noise levels that are equal to or greater than the FTA criteria) are predicted at all first- and second-row residences. As shown graphically in Figures 6 and 7 for all 2,024 receptors, *severe* noise impacts are predicted at 40 residences under the Preferred Alternative Scenario 1 (10,000-foot trains) while *moderate* noise impacts are predicted at an additional 27 residences. Similarly, *severe* noise impacts are predicted at 41 residences under Preferred Alternative Scenario 2 (6,000-foot trains) while *moderate* noise impacts are predicted at an additional 27 residences. Scenario 2 noise impacts are shown graphically in Figure 8. These noise impacts are due completely to the sounding of the train warning horn within 20 seconds of the public grade crossings at Wright and Dawson Streets. A complete listing of properties with noise impacts is provided in Table 6. Since *severe* noise impacts are predicted, the evaluation of mitigation measures is required.

While the historic building at 1121 South Front Street (winery restaurant "TRIC / Friends with Benefits Charity") is used as a restaurant and is therefore not considered sensitive to rail noise under the FTA guidelines, due to concerns by consulting parties under the Section 106 process, it is considered here. There is an existing active railroad 20 feet away from the building, which will be abandoned and left in place in the roadway; therefore, there will be no construction-related noise or vibration. The Project will place the new bypass track 106 feet away from the building, reducing existing operational noise levels from the current condition. The operational noise levels are predicted at 72 dBA at the exterior façade. Interior noise levels at this building would be 25-35 dBA lower due to transmission losses of a 2-story masonry building.

Figure 6: Project Area Noise Impacts Predicted under Preferred Alternative Scenario 1



Source: AECOM, May 2023.

Figure 7: Noise Impacts under Preferred Alternative Scenario 1

Source: AECOM, May 2023.

Figure 8: Noise Impacts under Preferred Alternative Scenario 2

Source: AECOM, May 2023.

Table 6: Inventory of Residences where Noise Impacts are Predicted under the Preferred Alternative

Receptor		Land	Existing	Preferred Alternative		Impact	Impact	
ID	Address	use	Condition	Scen 1	Scen 2	Criteria	Scen 1	Scen 2
3	**105 Meares St**	**RES**	**64**	**67**	**68**	**60 / 66**	**SEV**	**SEV**
4	**1105 Front St**	**RES**	**65**	**69**	**69**	**61 / 66**	**SEV[1]**	**SEV[1]**
16	210 Marstellar St	RES	67	63	63	62 / 68	MOD	MOD
18	**113 Wright St**	**RES**	**63**	**68**	**68**	**59 / 65**	**SEV**	**SEV**
19	**117 Meares St**	**RES**	**64**	**65**	**66**	**60 / 66**	**MOD**	**SEV**
20	**115 Wright St**	**RES**	**63**	**67**	**68**	**59 / 65**	**SEV**	**SEV**
25	**110 Dawson St**	**RES**	**62**	**67**	**68**	**59 / 64**	**SEV**	**SEV**
26	**3 Queen St**	**RES**	**60**	**64**	**64**	**58 / 63**	**SEV**	**SEV**
32	**110 Meares St**	**RES**	**65**	**66**	**67**	**61 / 66**	**SEV**	**SEV**
34	1017 2nd St	RES	64	64	65	60 / 65	MOD	MOD
35	1013 2nd St	RES	63	65	65	60 / 65	MOD	MOD
36	**926 2nd St**	**RES**	**63**	**66**	**67**	**59 / 65**	**SEV**	**SEV**
87	**111 Meares St**	**RES**	**64**	**67**	**67**	**60 / 66**	**SEV**	**SEV**
95	**922 2nd St**	**RES**	**62**	**66**	**67**	**59 / 65**	**SEV**	**SEV**
96	**106 Meares St**	**RES**	**65**	**67**	**68**	**61 / 66**	**SEV**	**SEV**
97	118 Meares St	RES	65	65	66	61 / 66	MOD	MOD
98	**1014 2nd St**	**RES**	**63**	**66**	**66**	**60 / 65**	**SEV**	**SEV**
99	**1016 2nd St**	**RES**	**64**	**66**	**66**	**60 / 65**	**SEV**	**SEV**
105	104 Marstellar St	RES	68	66	66	63 / 68	MOD	MOD
106	108 Marstellar St	RES	68	65	66	63 / 68	MOD	MOD
122	**202 Wright St**	**RES**	**63**	**65**	**66**	**59 / 65**	**SEV**	**SEV**
123	**114 Meares St**	**RES**	**65**	**66**	**66**	**61 / 66**	**SEV**	**SEV**
225	114 Marstellar St	RES	68	64	65	63 / 68	MOD	MOD
226	112 Marstellar St	RES	68	65	65	63 / 68	MOD	MOD
254	115 Marstellar St	RES	67	65	65	62 / 68	MOD	MOD
262	120 Meares St	RES	65	65	66	61 / 66	MOD	MOD
263	1112 2nd St	RES	66	65	66	62 / 67	MOD	MOD
274	1104 2nd St	RES	65	65	65	61 / 66	MOD	MOD
401	1109 2nd St	RES	65	64	65	61 / 66	MOD	MOD
402	1111 2nd St	RES	66	64	64	61 / 67	MOD	MOD
403	1105 2nd St	RES	65	64	65	61 / 66	MOD	MOD
404	1107 2nd St	RES	65	64	65	61 / 66	MOD	MOD
405	1103 2nd St	RES	65	64	65	61 / 66	MOD	MOD
449	202 Meares St	RES	65	64	65	61 / 66	MOD	MOD
450	201 Meares St	RES	64	64	65	60 / 66	MOD	MOD
604	**113 Meares St**	**RES**	**64**	**66**	**67**	**60 / 66**	**SEV**	**SEV**

605	208 Marstellar St	RES	68	63	64	63 / 68	MOD	MOD
626	1209 2nd St	RES	69	63	64	64 / 69	NO	MOD
627	1207 2nd St	RES	69	63	64	63 / 69	MOD	MOD
628	1208 2nd St	RES	69	64	64	64 / 69	MOD	MOD
629	1206 2nd St	RES	69	64	64	63 / 69	MOD	MOD
634	116 Marstellar St	RES	68	64	65	63 / 68	MOD	MOD
1540	1104 2nd St	RES	65	65	65	61 / 66	MOD	MOD
1611	**113 Meares St**	**RES**	**64**	**66**	**67**	**60 / 66**	**SEV**	**SEV**
1759	**1002 2nd St**	**RES**	**63**	**66**	**67**	**59 / 65**	**SEV**	**SEV**
1763	**201 Wright St**	**RES**	**63**	**65**	**66**	**59 / 65**	**SEV**	**SEV**
1766	**910 2nd St**	**RES**	**62**	**66**	**67**	**59 / 64**	**SEV**	**SEV**
1974	**113 Meares St**	**RES**	**64**	**66**	**67**	**60 / 66**	**SEV**	**SEV**
1980	**203 Wright St**	**RES**	**62**	**65**	**66**	**59 / 65**	**SEV**	**SEV**
1983	**203 Wright St**	**RES**	**62**	**65**	**66**	**59 / 65**	**SEV**	**SEV**
1984	**203 Wright St**	**RES**	**62**	**65**	**66**	**59 / 65**	**SEV**	**SEV**
1985	**203 Wright St**	**RES**	**62**	**65**	**66**	**59 / 65**	**SEV**	**SEV**
1986	**203 Wright St**	**RES**	**62**	**65**	**66**	**59 / 65**	**SEV**	**SEV**
1987	**203 Wright St**	**RES**	**62**	**65**	**66**	**59 / 65**	**SEV**	**SEV**
1988	**203 Wright St**	**RES**	**63**	**65**	**66**	**59 / 65**	**SEV**	**SEV**
1989	**203 Wright St**	**RES**	**62**	**65**	**66**	**59 / 65**	**SEV**	**SEV**
1990	**203 Wright St**	**RES**	**62**	**65**	**66**	**59 / 65**	**SEV**	**SEV**
1991	**203 Wright St**	**RES**	**62**	**65**	**66**	**59 / 65**	**SEV**	**SEV**
1992	**203 Wright St**	**RES**	**62**	**65**	**66**	**59 / 65**	**SEV**	**SEV**
1993	**203 Wright St**	**RES**	**62**	**65**	**66**	**59 / 65**	**SEV**	**SEV**
1994	**203 Wright St**	**RES**	**62**	**65**	**66**	**59 / 65**	**SEV**	**SEV**
1995	**203 Wright St**	**RES**	**62**	**65**	**66**	**59 / 65**	**SEV**	**SEV**
1996	**203 Wright St**	**RES**	**62**	**65**	**66**	**59 / 65**	**SEV**	**SEV**
1997	**203 Wright St**	**RES**	**62**	**65**	**66**	**59 / 65**	**SEV**	**SEV**
1998	**203 Wright St**	**RES**	**62**	**65**	**66**	**59 / 64**	**SEV**	**SEV**
2012	**1002 2nd St**	**RES**	**63**	**66**	**67**	**59 / 65**	**SEV**	**SEV**
2015	**115 Meares St**	**RES**	**64**	**66**	**66**	**60 / 66**	**SEV**	**SEV**
2016	1015 2nd St	RES	64	65	65	60 / 65	MOD	MOD

Note: The Preferred Alternative includes two operating conditions, Scenario 1 ('Scen 1') and Scenario 2 ("Scen 2").

1. For nighttime construction, Project noise levels are predicted to exceed the FTA 'nighttime' criteria at a residence at 1105 Front Street.
2. Highlighted rows indicate contributing resources to the Wilmington Historic District.

Source: AECOM, May 2023.

4.3.4 Vibration

As shown in Table 5, operational vibration levels at the selected residences under the Preferred Alternative would be like noise currently along the Beltline. None of the future operational

vibration levels from the proposed locomotive operations (with maximum predicted levels up to 75 VdB) are predicted to exceed the FTA *infrequent* impact criteria of 80 VdB at residential receptors. Similarly, none of the future operational vibration levels from the proposed railcar operations (with maximum predicted levels up to 64 VdB) are predicted to exceed the FTA *frequent* impact criteria of 72 VdB at residential receptors. Overall, there will be no new vibration impacts to any property east of Front Street under the Preferred Alternative. The lack of operational vibration impacts is due to the routing of the track on the bypass alignment to west of South Front Street away from residences combined with the slow travel speeds. Therefore, operational vibration levels along the Project rail corridor would be well below the FTA impact criteria. Additionally, track switches (which typically contribute to elevated vibration levels due to the gap in the rail) are proposed away from residences to further minimize the potential for adverse impacts.

5 MITIGATION

Because FTA *severe* noise impacts are predicted due to train warning horns at the at-grade crossings at Wright and Dawson Streets during future Project operations, noise mitigation measures are identified for consideration. The following noise control measures are recommended for further consideration during final design to determine feasibility and reasonableness. Since the noise impacts are due to the train warning horns, noise walls or barriers are not recommended because they would not be effective against train warning horns. With mitigation that would eliminate the train warning horns at the Wright and Dawson Street crossings, no *severe* or *moderate* noise impacts are predicted for the Project.

- Street Closures – Dawson Street
    - Close Dawson Street to public traffic or installation of permanent gates for controlled access only. With the planned closure of the connecting roadway at Surrey Street, Dawson Street would become a dead-end roadway with limited access needed only for a private property owner or emergency services.
    - The closure of this crossing to public traffic with controlled access only would eliminate the need for train warning horns at this grade crossing; however, train warning horns would still be required at the adjacent Wright Street crossing, which would be mitigated separately as described below.
- Street Reassignments – Wright Street
    - Convert the western end of Wright Street from a public roadway into a private driveway. This conversion would eliminate the train warning horn requirement from 49 CFR Part 222.
    - Reassignment of Wright Street from public access to private access would potentially require approvals from the Wilmington City Council and Planning

Boards and agreement with the private property owners accessed by this roadway.

The effectiveness and efficacy of these control measures will be investigated in more detail during the future final design phase of the Project when details of the bypass alignment and other engineering considerations are better defined. Additionally, since no Project operational vibration impacts are predicted, no control measures are required for vibration.

6 CONSTRUCTION ANALYSIS

Due to the scope of the Project and the facilities proposed for construction, temporary noise and vibration impacts are expected to occur. To maintain a balance between constructing the Project and quality of life for nearby communities, the City of Wilmington and its contractors are bound by Federal, State and local guidelines to use construction techniques and incorporate control measures to eliminate or minimize construction noise and vibration impacts. Since specifics on the types of equipment proposed would not be identified by the City of Wilmington until final design when construction plans are developed, the analysis of construction effects is a preliminary estimation of the types of noise and vibration effects that could be expected during the construction phase of the Project. The preliminary estimation of construction noise and vibration effects would be refined during future Project design when details of the Project elements, construction locations, equipment types, equipment usage, and schedules are developed.

6.1 CONSTRUCTION ANALYSIS CRITERIA

6.1.1 Noise

FTA's Manual Section 7.1 presents the basic concepts, methods, criteria and procedures for evaluating the extent and severity of temporary construction noise impacts from transit projects. As shown in Table 7, criteria based on the one-hour average noise level or Leq(h) were used to assess preliminary construction noise impacts at the same receptors selected for the long-term operational analysis. These criteria are intended for a general noise assessment when details of the construction activities are not yet known and would not be developed until the final design phase.

Table 7: FTA General Assessment Construction Noise Criteria

Land Use	1-Hour Leq (dBA)	
	Day	Night
Residential	90	80
Commercial	100	100
Industrial	100	100

Source: FTA Manual, Table 7-2.

6.1.2 Vibration

FTA's Manual Section 7.2 presents the basic concepts, methods, criteria and procedures for evaluating the extent and severity of temporary construction vibration impacts from transit projects. The concern regarding vibration from construction activities (such as pile driving and other heavy impact equipment) is the potential for cosmetic and structural damage to nearby buildings. The peak particle velocity vibration level (PPV), which is typically expressed in inches per second, was used to assess the potential for damage at residences and other sensitive receptors using the criteria shown in Table 8. The PPV vibration level represents the maximum peak level and is, therefore, typically used to assess stresses on buildings that could cause damage.

Table 8: FTA Construction Vibration Damage Criteria

Building Category	PPV (in/sec)	RMS (VdB)
I. Reinforced-concrete, steel or timber (no plaster)	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
III. Non-engineered timber and masonry buildings	0.2	94
IV. Buildings extremely susceptible to vibration damage	0.12	90

Notes: PPV = peak particle velocity; RMS = root mean square; VdB = vibration decibels

Source: FTA Manual, Table 7-5.

Additionally, the RMS vibration criteria shown in Table 4 were also used to assess the potential for annoyance and interference with vibration-sensitive activities because PPV is not a good indicator of human response.

6.2 Prediction Methodology

A Quantitative Construction Noise and Vibration Assessment was conducted because the Project construction is projected to occur over several years. An FTA General Assessment of construction noise and vibration was conducted for the Project because it is in an early assessment stage when the equipment roster and schedule are undefined and only a rough estimate of construction noise levels is practical. Based on the long-term noise assessment, a construction assessment was conducted for the fabrication of the at-grade and elevated track structure along with several bridges over the Caper Fear River.

6.2.1 Noise

As part of the General Assessment, the two noisiest pieces of equipment expected to be used in each phase of construction were selected and their cumulative noise levels added together. As a conservative assumption, each piece of equipment is assumed to operate continuously for one hour with no ground attenuation effects. Using FTA Equation 7-1, the construction equipment noise levels were adjusted for each receptor's distance only. The selected equipment types and reference noise levels are summarized in Table 9.

Table 9: FTA Construction Equipment Noise Emission Levels

	Reference	Estimated Equipment Selection		
Equipment	SPL	At-Grade Track	Viaduct	Bridge
Ballast Tamper	83	1	--	--
Crane, Derrick	88	--	1	1
Grader	85	1	--	--
Pile Driver (Impact)	101	--	1	1

Notes: SPL = sound power level at 50 feet

Source: FTA Manual.

6.2.2 Vibration

As part of the General Assessment, the potential for damage and annoyance from each individual piece of equipment was evaluated. As part of the preliminary assessment, two pieces of equipment were selected to represent the types of activity that could occur for each construction type. Ground vibration from construction equipment spread through the ground and diminish in strength with distance. The ground and distance attenuation factors for peak particle velocity (PPV) and root mean square (RMS) vibration levels included in FTA's Manual were applied to each equipment type. Using FTA Equations 7-2 and 7-3, the construction equipment vibration levels were adjusted for each receptor. No other adjustments were applied. The selected equipment types and reference noise levels are summarized in Table 10.

Table 10: FTA Vibration Source Levels for Construction Equipment

	Reference		Estimated Equipment Selection		
Equipment	PPV	RMS	Viaduct	Stations	Substation
Pile driver (impact), Typical	0.644	104	--	1	1
Vibratory roller	0.21	94	1	--	--
Large bulldozer	0.089	87	1	--	--
Caisson drilling	0.089	87	--	1	1

Notes: PPV = peak particle velocity; RMS = root mean square

Source: FTA Manual.

6.3 Construction Analysis Results

Although most of the bypass is along remote areas such as through Eagles Island, construction of the new bypass west of South Front Street could cause temporary noise and vibration disturbances at residences and other properties east of South Front Street between the wye and Dawson Street to the north. Additionally, noise from impact devices such as pile drivers could also affect residences farther away although their use would be more limited. However, these impacts would be temporary, sporadic and variable throughout the duration of the construction period. No pile driving is proposed adjacent to or near the historic district.

6.3.1 Noise

As shown in Table 11, maximum one-hour noise levels from Project construction activities are predicted to range from 61 dBA at Site 2 (a residence at 1221 9th Street) along the Beltline to 74 dBA at Site 3 (a residence at 105 Meares Street) along the new bypass alignment. The loudest noise levels would be due to the potential use of graders and ballast tampers along the new bypass alignment used for constructing the new track (such as Site 2). Overall, Project construction activities are not predicted to exceed the FTA 'daytime' or 'nighttime' noise impact criteria at any of the residences.

Construction noise levels at the historic building at 1121 South Front Street (winery restaurant "TRIC / Friends with Benefits Charity") are predicted to range from 68 dBA for bridge construction to 80 dBA for track construction. These temporary noise levels are well below the FTA construction criterion of 100 dBA for commercial properties at the exterior facade. Interior noise levels at this building would be 25-35 dBA lower due to transmission losses of a 2-story masonry building.

6.3.2 Vibration

As shown in Table 11, PPV vibration levels (to assess damage) during Project construction are predicted to range from well below background at Site 2 along the Beltline to 0.006 in/sec at Site 1 (multi-family residences at 105 Laughing Lane) at the wye to 0.008 in/sec at Site 3 (a residence at 105 Meares Street) along the new bypass alignment. Similarly, RMS vibration levels (to assess annoyance) are predicted to range from 35 VdB at Site 2 along the Beltline to 65 VdB at Site 3 along the new bypass alignment. The highest vibration levels are due to the potential use of an impact pile driver for bridge construction. Overall, construction vibration levels are not predicted to exceed the Project damage criteria anywhere. However, construction vibration levels from potential vibratory rollers or bulldozers are predicted to exceed the FTA annoyance criterion of 72 VdB at one residence at 1105 South Front Street. There are no impacts due to potential pile driving activities at the bridge.

Construction vibration at the historic building at 1121 South Front Street (winery restaurant "TRIC / Friends with Benefits Charity") is predicted at 0.025 in/sec PPV for track construction.

These temporary vibration levels from track grading and vibratory rollers are orders of magnitude below the conservative FTA damage criterion of 0.5 inches per second for commercial properties. In other words, the worst-case construction vibration level at this location (0.025 in/sec or 68 VdB) is predicted to be only slightly above the typical threshold of perception for humans which is around 65 VdB.

Table 11: Predicted Construction Noise and Vibration Levels at Residences under the Preferred Alternative

ID	Address	Land use	FTA Cat.	Noise dBA	Criteria Day/Night dBA	Impact Day/Night	Vibration PPV, ips	Criteria Cat I, ips	Impact PPV	Vibration RMS, VdB	Criteria Frequent, VdB	Impact RMS
1	105 Laughing Oak Ln	RES	2	73	90 / 80	- / -	0.006	0.5	--	64	72	--
2	1221 9th Street	RES	2	61	90 / 80	- / -	0.000	0.5	--	35	72	--
3	105 Meares Street	RES	2	74	90 / 80	- / -	0.008	0.5	--	65	72	--
	Total Impacts		2			0 / 1			0			1

Notes: -- = no impact; Cat. = category; dBA = decibel; PPV = peak particle velocity; RES = residence; RMS = root mean squared

Source: AECOM, December 2022.

6.4 Construction Mitigation

During final design, the City of Wilmington would assess the potential for temporary noise and vibration impacts during Project construction and identify measures to minimize construction impacts as warranted. The City of Wilmington would include these measures in the Project construction plan. During Project construction, the City of Wilmington would implement noise and vibration commitments according to the Project construction plan.

In addition, the following noise and vibration control measures would be assessed to determine their feasibility and reasonableness during Project construction:

- All construction would generally occur during the daytime or evening periods to comply with local noise limits such as the "Code of Ordinances of the City of Wilmington, North Carolina", specifically Chapter 6, Article II, Section 6-26. Noise Control. These local ordinances restrict nighttime construction between midnight and 7:00 am.
- At staging and laydown areas, consider installing acoustical curtains or other temporary noise shields to perimeter fencing to act as a temporary noise barrier.
- Strategic placement of containers or other barriers along the perimeter of staging areas would shield nearby residences from construction activities within the laydown area.
- Substituting impulsive equipment such as pile drivers and hoe rams with augers and vibratory pile drivers whenever possible.
- For continuous stationary equipment such as cranes, generators or pumps, enclose or shroud this equipment with temporary or semi-permanent barriers or acoustical enclosures.
- Acoustical curtains or other limp mass barriers hung so as to shield nearby noise-sensitive receivers from the loudest equipment or activities.
- In general, utilize equipment enclosures or shrouds for all exposed stationary equipment while other solutions (such as portable acoustical curtains hung from cranes) may be more practical for mobile sources.
- All equipment should include properly tuned exhaust mufflers or attenuators that comply with the local and municipal noise ordinances.
- Substitute impact devices (such as pile drivers) with less vibratory equipment such as augers.
- Additionally, utilize regional roadways rather than local streets for excavation of spoils and new deliveries to further minimize the construction impacts (i.e., noise, vibration, air quality, visual, traffic, etc.) on the nearby community.

7 REFERENCES

National Environmental Policy Act (NEPA), 42 U.S.C. § 4321 et seq.

Council on Environmental Quality (CEQ) regulations, 40 C.F.R. Parts 1500 -1508.

Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, FTA Report No. 0123, September 2018.

U.S. Environmental Protection Agency, "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety", Report No. 550/9-74-004, Washington DC, March 1974.

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Federal Railroad Administration, *High-Speed Ground Transportation Noise and Vibration Impact Assessment*, DOT/FRA/ORD-12/15, Washington, DC, September 2012.

Appendix H: Public Outreach and Agency Correspondence

Appendix H1: Public Outreach

Appendix H1.1: Virtual Open House #1 Materials

Appendix H1.2: Virtual Open House #2 Materials

Appendix H2: Agency Correspondence

Appendix H2.1: Summary Table of Agency Correspondence to Date

Appendix H2.2: Agency Correspondence – Letters, Meeting Summaries, and Other Materials

APPENDIX H1: PUBLIC OUTREACH

APPENDIX H1.1: VIRTUAL OPEN HOUSE #1 MATERIALS

WILMINGTON RAIL REALIGNMENT

The City of Wilmington invites you to our first virtual open house during the Wilmington Rail Realignment's Environmental Review Process.

YOU'RE INVITED!

VIRTUAL OPEN HOUSE

Where **wrr.nepa.ai**

When **Monday Nov 16th, 2020 - Tuesday Dec 15th, 2020**

Visit wrr.nepa.ai anytime between Monday Nov 16th and Tuesday Dec 15th to learn about the project and to submit comments.

About the Project

The City of Wilmington (City) is proposing a bypass route for the existing freight rail line between Navassa (Davis Yard) and the Port of Wilmington. The proposed bypass route would create a new freight rail alignment that would improve freight rail operations, regional transportation mobility and public safety.

We hope you join the conversation. Your voice can help shape the way the Rail Realignment Project moves forward.

This virtual open house will allow you to explore initial options that are being considered for the rail bypass route between Navassa and the Port of Wilmington.

For more information or to sign up to receive updates on the Rail Realignment Project, visit: www.wilmingtonnc.gov/rail

Visit During One of the "Live Chat" Events!

Our project team will be available to answer questions and receive comments at wrr.nepa.ai through a "Live Chat" feature on Thursday Nov 19th from 5PM to 7PM and on Tuesday Dec 1st from 3PM to 5PM.

Memo to File

A virtual open house was available to the public from November 16, 2020 to December 15, 2020. Preliminary project information and materials were available for viewing during this time.

The virtual open house was advertised by several media outlets including local news channels and newspapers. The following advertisement methods were implemented:

- **Public Outreach Work Session** – The City of Wilmington met with community leaders representing the Project Study Area and minority and/or low-income communities – held on October 6, 2020.
- Wilmington City Council Meeting – Announcement of the virtual open house made to representatives, attendees, and the general public at the October 20, 2020 Wilmington City Council Meeting.
- City of Wilmington Social Media Plan – Posts made by the City of Wilmington Social Media accounts to promote the Virtual Open House via Facebook, Nextdoor, Instagram TV, and Twitter over the weeks for which the Virtual Open House was live.
- **Postcard Mailings** – Distribution of nearly 10,000 postcards to addresses along the existing rail corridor.
- Project Website Updates – Directly links on the City of Wilmington's project website directing to the Virtual Open House.
- Quarterly Project Updates – Announcements made in the Quarterly Project Updates which reach approximately 400 citizens through a distribution list and are also posted to the City of Wilmington's website.
- Direct Communication with Level 3 Stakeholders – Direct communication and engagement efforts were made with impacted communities/neighborhoods, impacted property owners, and any impacted stakeholder requesting additional information (identified in the Public Involvement Plan as Level 3 stakeholders).
- **Local Media Advertisements** – Online advertisements in the Wilmington Journal.
- Email Notifications – Specific email notifications to the Citizen Contact Distribution list and **community leaders present at the October 6, 2020 Public Outreach Work Session**.
- **Flyer Distribution** – Fliers posted at various public places within the City, including MLK Community Center, Dereck GS Davis Center, New Hanover County Main Library & Law Library, New Hanover County Northeast Regional Library, New Hanover County Pine Valley Library.
- **Hard Copy Meeting Materials** – Meeting materials presented during the Virtual Open House were made available at the following locations: MLK Community Center, Dereck GS Davis Center, New Hanover County Main Library & Law Library, New Hanover County Northeast Regional Library, New Hanover County Pine Valley Library.

Items listed above in bold font were part of the targeted minority and/or low-income community outreach.

A welcome video began as soon as the room was entered and gave a brief introduction of the Project and the layout of the room. The virtual room housed several informational boards and materials displaying the Project Study Area, preliminary Purpose and Need of the Project, the Project timeline,

how a route is selected in the NEPA process, maps and details of the corridors under consideration in the draft Screening Report, interactive data maps representing those used in the development of the Screening Report, initial and preliminary results of the Screening Report, and the next steps in the Project. A virtual center table included draft documents of the Purpose and Need and Screening Report, as well as guidance information on the NEPA process. Finally, a comment station was accessible to leave comments. Representatives of the project team and the City of Wilmington were available for live chat with members of the community on November 19, 2020 from 5 PM to 7 PM and December 1, 2020 from 3 PM to 5 PM. The opportunity for the live chat was advertised by local news stations, through the posting of flyers at community centers, and through social media.

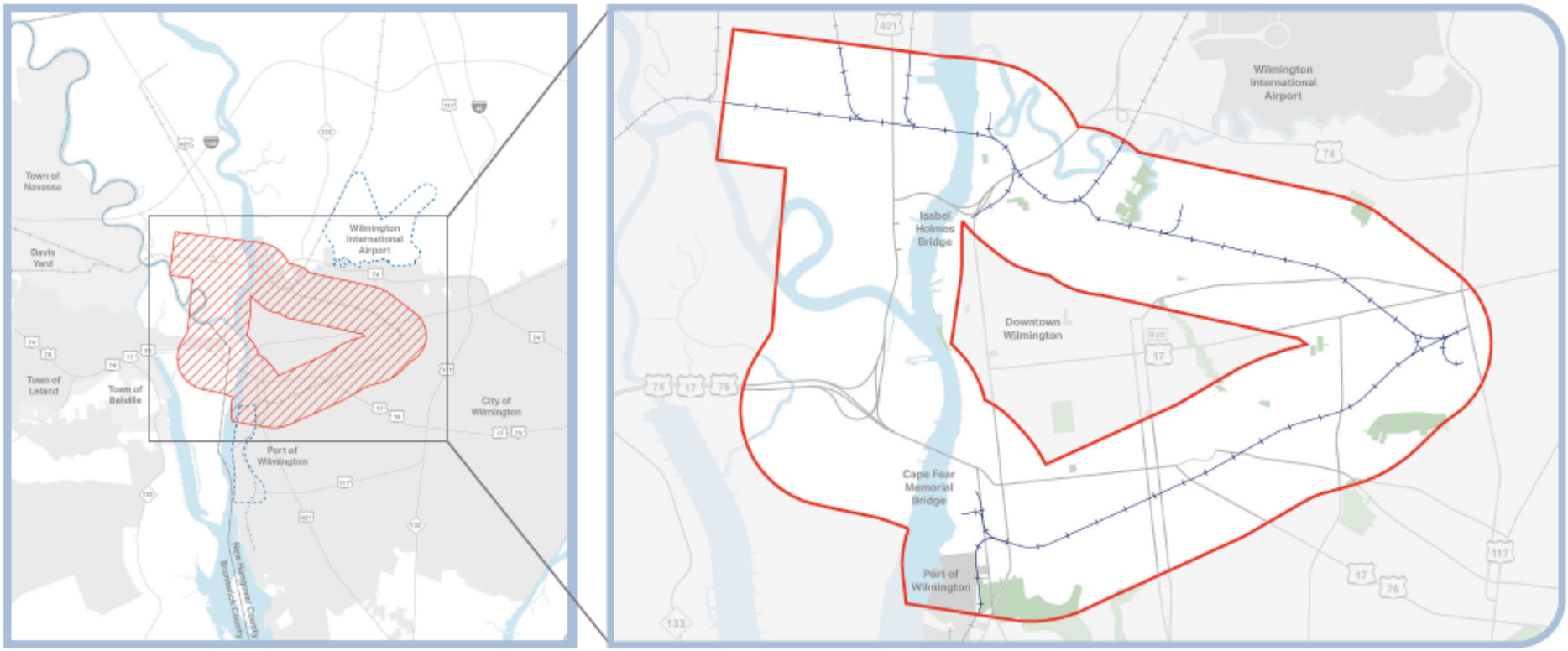
Approximately 56 public comments were received during the public forum. Topics of the comments received include:

- Opposition to the No-Build Corridor and the Upgrade Existing Corridor
- Safety concerns regarding the at-grade crossings of the existing rail line which would be impacted by the No-Build Corridor, and the Upgrade Existing Corridor
- Traffic congestion concerns regarding current and future delays due to train movements through the City associated with the No-Build Corridor and the Upgrade Existing Corridor
- Noise impacts in the evening disrupting the quality of life associated with the No-Build Corridor and the Upgrade Existing Corridor
- Hydrological concerns such as flooding and increased stormwater runoff due to additional infrastructure associated with the build corridors
- Natural resource impacts to areas on Eagles Island and the Cape Fear River associated with the new location corridors
- Historic resource impacts associated with all corridors due to the vicinity of the corridors to the Wilmington Historic District and Cape Fear Memorial Bridge
- Ensuring sea level rise considerations are taken into account for the design of potential new location corridors
- Bicycle and pedestrian network impacts associated with the No-Build corridor
- Ensuring bicycle and pedestrian network connectivity is taken into account for the design of potential build corridors
- Consideration of minority and/or low-income community impacts and betterments for all corridors

Additionally, comments were received which requested that an additional corridor be considered that is located south of the existing corridors, closer to the south entrance of the Port. Comments suggested that a southern corridor might reduce impacts to the Historic Downtown Wilmington and surrounding communities. Several comments also inquired about the use of the rail right-of-way after freight rail is removed and requested passenger rail/transit be investigated further.

Attachments:
Open House Display Boards

PROJECT STUDY AREA



The City of Wilmington (City) is proposing a bypass route for the existing freight rail line between Navassa (Davis Yard) and the Port of Wilmington. The proposed bypass route would create a new freight rail alignment that would improve freight rail operations, regional transportation mobility and public safety.

The Project Study Area is located primarily within the City of Wilmington but also extends into Brunswick County and New Hanover County. The Project Study Area encompasses approximately a one-mile area centered on the existing CSXT rail line from east of Navassa to the Port of Wilmington through downtown Wilmington and along the proposed new location corridors west of the Cape Fear River.

CITY OF WILMINGTON NORTH CAROLINA

PROJECT PURPOSE & NEED

The primary purpose of the Wilmington Rail Realignment Project is to improve safety and regional transportation mobility, while also improving the resiliency, reliability, and operational fluidity of the sole freight rail route connecting southeastern North Carolina with the Port of Wilmington.

Improved Safety

The Project would considerably reduce the number of crossing conflicts between vehicles and freight trains on the route through Wilmington. Eliminating crossing conflicts also eliminates the risk of fire and emergency response times being inhibited by passing trains, thereby enhancing the opportunity to save lives and property.

Improved Regional Transportation Mobility

The Project would considerably reduce the the potential for freight rail operations to obstruct regional public mobility. Vehicular traffic as well as the length and frequency of freight trains are expected to grow rapidly in the region.

Improved Resiliency

The resiliency of the sole freight rail route serving the region would be improved by providing higher river crossings and infrastructure better designed to mitigate flood related damages.

Improved Reliability

Reliability of travel in the region would improve as crossing conflicts and delays across Wilmington's main thoroughfares are reduced. Also, compared to the existing freight rail route, newer infrastructure would require less downtime for maintenance.

Improved Operational Fluidity

The Project would create a shorter freight rail route between Navassa and the Port of Wilmington resulting in travel time savings and increased throughput capacity.

CITY OF WILMINGTON NORTH CAROLINA

PROJECT TIMELINE

Environmental Review

We are here

Screening Report	Alternatives Analysis Report	NEPA* Environmental Assesment	Federal Environmental Finding
Public Involvement	Public Involvement	Public Involvement	
Objectives			
Development of Purpose and Need Statement	Refinement of Alternatives (Route Options)	Analysis of Locally Preferred Alternative versus a No-Build Scenario	Completion of the NEPA Process
Identification of Alternatives (Route Options)	Identification of Locally Preferred Alternative	Determination of Significance of Impacts	

Overall Project Timeline

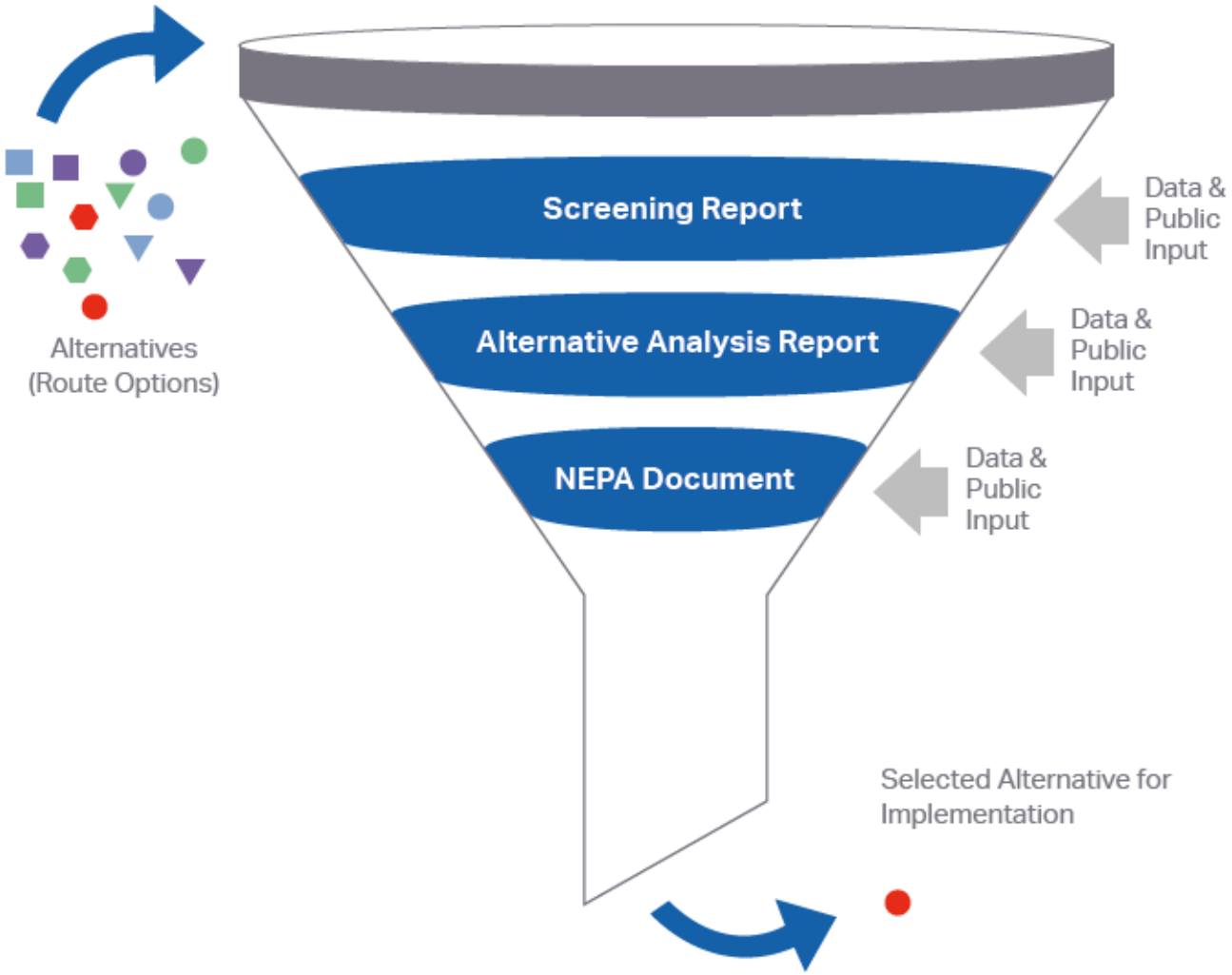
- 2015 Mayor's Taskforce
- 2017 Feasibility Study
- 2019 FRA** Grant Awarded
- **2020 - 2022 Environmental Review**
- 2022 15% Design Plans
- 2023 30% Design Plans
- TBD Final Design Plans
- TBD Construction

* The environmental review process will be carried out pursuant to the National Environmental Policy Act (NEPA). Please see the virtual pamphlet on the table in the center of the room to learn more about NEPA.

** FRA= Federal Railroad Administration

CITY OF WILMINGTON NORTH CAROLINA

HOW IS A ROUTE SELECTED?



A multi-step environmental review process will allow the City of Wilmington to iteratively involve the public, community groups and regulatory partners in the process of generating scientific reports which will narrow down alternatives (route options) for a new bypass rail route between Navassa and the Port of Wilmington. This first round of public input coincides with the release of an initial Screening Report document (available on the center table). Public comments received will inform the completion of the Screening Report and the remainder of the environmental review process.

Additional public outreach and agency coordination will occur throughout the environmental review process to select an alternative for implementation.

CITY OF WILMINGTON NORTH CAROLINA

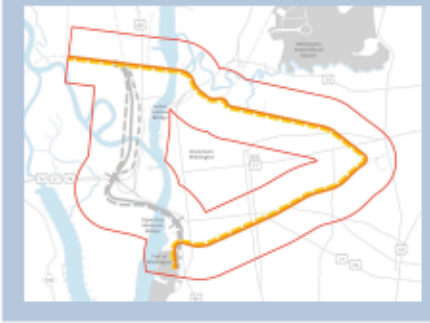
CORRIDOR DETAILS

The Screening Report introduces and analyzes multiple options for a bypass rail route connecting the Port of Wilmington to Davis Yard in Navassa. To adhere to federal NEPA requirements, the Screening Report also analyzes the impacts associated with a "No-Build" scenario (where no change occurs) and an "Upgrade Existing" scenario (where the existing rail route is improved for future needs).

We'd love your feedback!

Let us know what you think at the comment station.

No-Build / Upgrade Existing



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Section I - Options a / b

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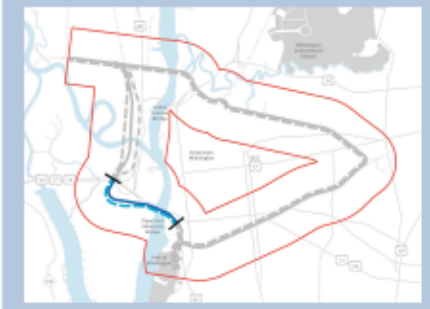
Section II - Options a / b



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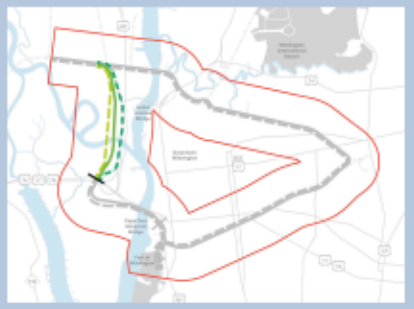
Section III - Options a / b / c



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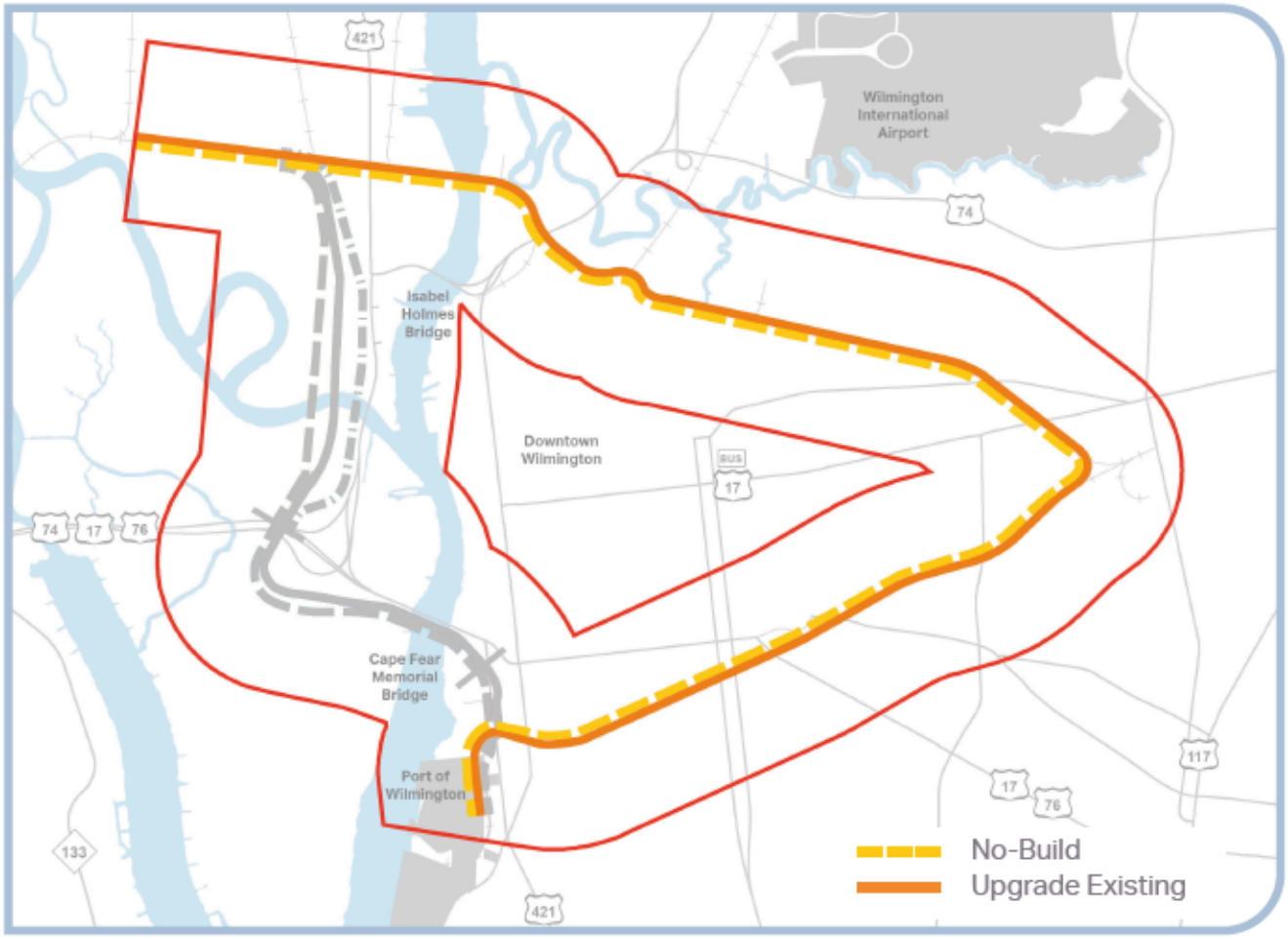
CITY OF WILMINGTON NORTH CAROLINA

CORRIDOR DETAILS

No-Build / Upgrade Existing



NO-BUILD CORRIDOR

The No-Build Corridor follows the existing alignment and assumes the implementation of any funded projects within the Project Study Area that are associated with the existing rail line.

UPGRADE EXISTING CORRIDOR

The Upgrade Existing Corridor would follow the existing alignment from Davis Yard to the Port of Wilmington. The Upgrade Existing Corridor would improve the existing alignment and its features to the extent practicable to meet the stated Purpose and Need of the Project. Improvements would include the conversion of at-grade crossings to grade separated crossings.

CITY OF WILMINGTON NORTH CAROLINA

CORRIDOR DETAILS

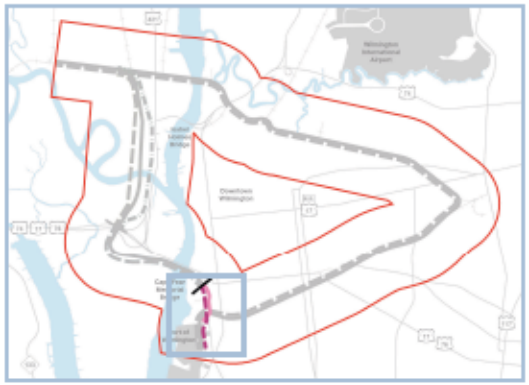
Section I - Options a / b

Section I includes an analysis of corridor options in Wilmington along S Front Street that tie into the Port facilities.

SECTION I – S FRONT STREET AND PORT OF WILMINGTON AREA

Section I – Option a from south to north, this corridor option ties into the existing WTRY line then follows along the west side of S Front Street until Wright Street.

Section I – Option b from south to north, this corridor option ties into the existing WTRY line then follows along S Front Street until Wright Street, slightly east of Section I - Option a.



CITY OF WILMINGTON NORTH CAROLINA

CORRIDOR DETAILS

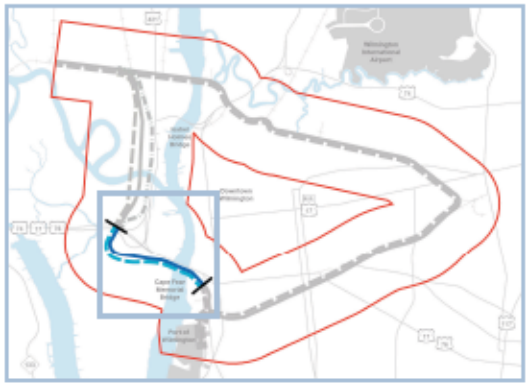
Section II - Options a / b

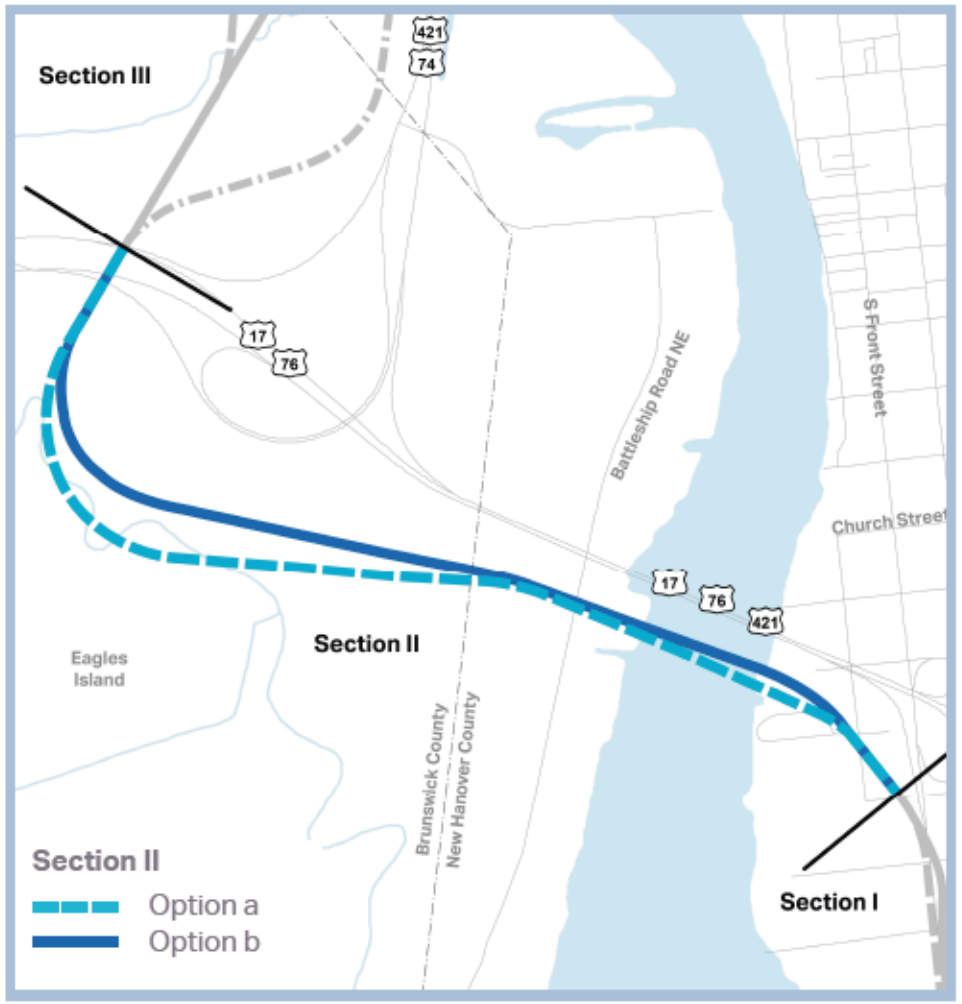
Section II includes an analysis of corridor options that cross the Cape Fear River and traverse Eagles Island south of the existing US 17/74/421 interchange.

SECTION II – CROSSING OF CAPE FEAR RIVER AND AREA SOUTH OF US 17/74/421 INTERCHANGE

Section II – Option a ties into the corridors in Section I and crosses the Cape Fear River south of the Cape Fear Memorial Bridge. The corridor travels on Eagles Island over the Alligator River, south and west of the US 17/74/421 interchange.

Section II – Option b roughly follows the same alignment as Option a, but shifts slightly to the east in order to better align the corridor option with the Cape Fear Memorial Bridge Replacement project and to reduce impacts to Alligator Creek.





CITY OF WILMINGTON NORTH CAROLINA

CORRIDOR DETAILS

Section III - Options a / b / c

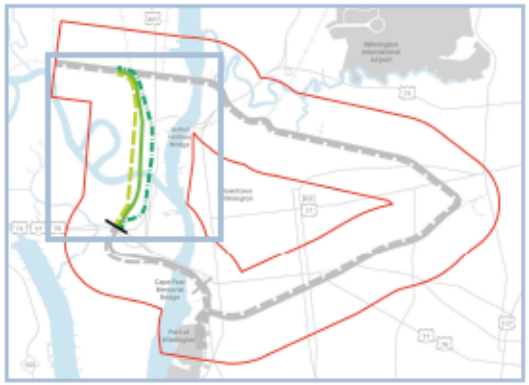
Section III includes an analysis of corridor options that begin after crossing US 17/74/421 and continue north to the existing railyard.

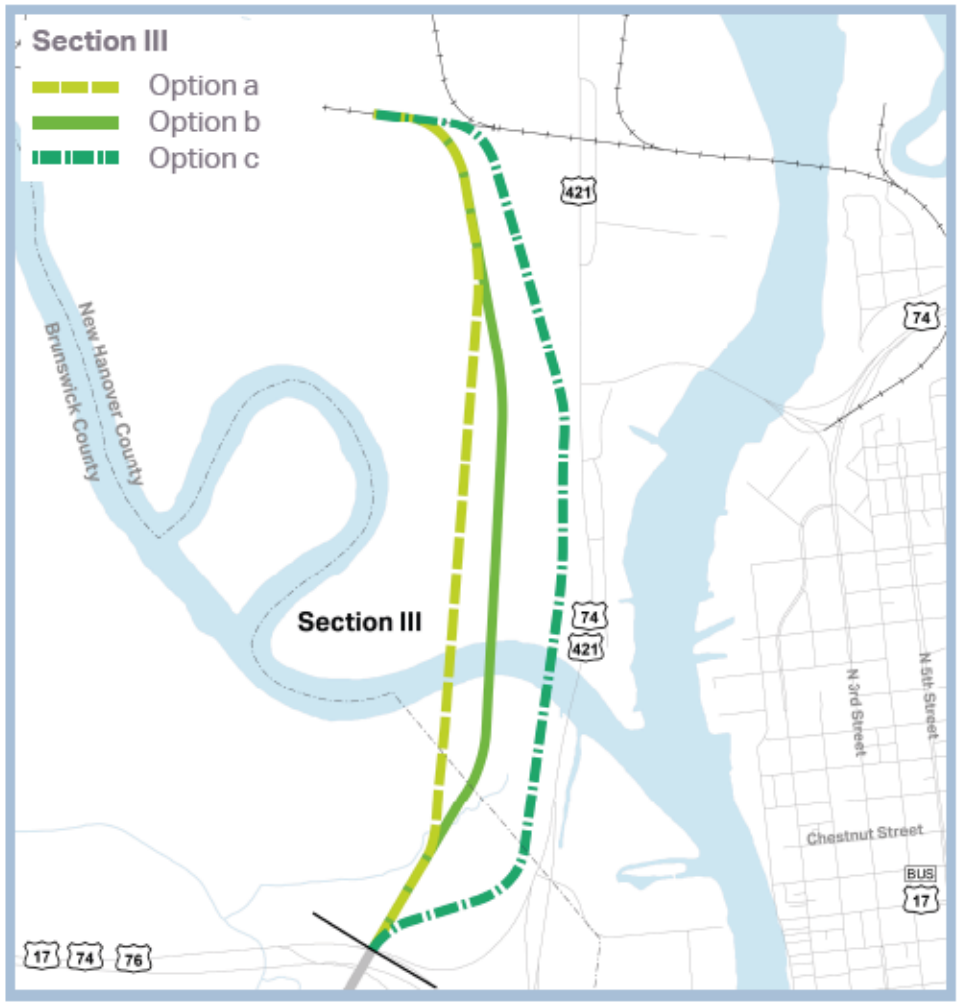
SECTION III – US 17/74/76 TO EXISTING CSXT SE LINE

Section III – Option a ties into the corridors in Section II and travels north, west of US 74/421 to tie back into the existing CSXT mainline west of US 421.

Section III – Option b ties into the corridors in Section II and travels north slightly to the east of Option a, which uses a portion of a former railway embankment and crosses the existing utility easement twice.

Section III – Option c ties into the corridors in Section II and travels north farthest to the east, parallel to US 74/421 before turning west to tie back into the existing CSXT mainline west of US 421.





CITY OF WILMINGTON NORTH CAROLINA