Section

4 AFFECTED ENVIRONMENT

4.0 Affected Environment

The study corridor used to identify various resources within the program's affected environment is comprised of the seven sections described in Chapter 3, Section 3.3.7.1 and illustrated in Exhibit 3.3-10. Depending on the resource and the available information collected, the width of the study corridor varied. The various study corridor widths are described in each of the resource sections.

4.1 Existing Land Use

4.1.1 Development Patterns

Historically, Chicago and St. Louis have served as major continental transportation centers, both tracing their origins to water and rail transportation routes. Chicago prospered from its strategic location on Lake Michigan and access to eastern markets through the Erie Canal and the Great Lakes. St. Louis originally developed from its role as a port on the Mississippi River that provided access to domestic and foreign markets. During the 19th Century, the addition of railroads linking these cities forged an economic lifeline between Chicago and St. Louis. Construction of the rail network spawned the growth of numerous communities that served as regional centers for the collection and distribution of goods for a rich agricultural region. The influence of the railroad remained strong until interstate highways joined the transportation system in the 1950s and 1960s. In contrast to the railroads, which created new communities along their length to maintain and support the railroads, interstate highways were constructed around, and often bypassed some communities. Because the interstates had limited points of access, county roads that connected with or crossed over interstates, linking existing communities, became particularly important to the rural areas. As the economy of the region and the nature of agribusiness have changed, both highways and railroads have remained important elements of community life.

Since the railroad is located in a general northeast-southwest direction between Chicago and St. Louis, city and village streets, typically designed on a north-south/east-west grid system, cross the tracks at sharp angles. This configuration was not a serious traffic problem when rail crossings were traversed by pedestrians or horses. However, the combination of automobile and truck traffic, at notably increased volumes, and the diagonal orientation of intersections, has compromised safety and operational efficiency at many rail crossings within rural communities. The use of larger agricultural vehicles, which are periodically driven to town to deliver grain to the local grain elevator, has also contributed to traffic congestion and hazards at highway-railroad grade crossings. Depending upon the size of the community, the number of highway-railroad at-grade crossings typically ranges from three to 15, with three to five crossings typically in the smaller communities and 10 to 15 in the regional centers.

Old U.S. Route 66, a historic federal road, runs parallel to the rail corridor between Cook County and Springfield and serves a unique and important role in providing direct

highway access along the railroad to each corridor community. Roads crossing the railroad tracks are generally at-grade and are important to the maintenance of continuity of the roadway system, providing access across the tracks to Old U.S. Route 66, farmland, rural residences, or the interstate. Private rail crossings have been constructed for privately-owned parcels that are separated from roadway access by the tracks. In some instances private crossings provide the sole access to a parcel.

The downtown areas of the small rural communities along the study corridor developed in a compact pattern along the railroad. The location of buildings and uses, determined by railroad accessibility, resulted in a clustering around the train stations and sidings. Land uses that relied heavily upon rail service concentrated in this area and include uses such as: grain elevator, post office, passenger train station, commercial establishments, and industrial plants and mills. Other facilities important to community life, such as the town hall, a civic park, school, fire station, post office, hotel, and dining establishments, were also often constructed in proximity to the railroad passenger station. These facilities continue to play a key role in the economic and social livelihood of the downtown core while serving residents throughout the community.

Six rural communities along the study corridor have developed into regional centers over the past century. These are: Joliet, Bloomington/Normal, Lincoln, Springfield, Carlinville, and Alton. The population, land uses, building density, and the local transportation system distinguish the regional centers from the rural communities. The regional centers also typically have a wide range of agricultural, commercial and industrial services and suppliers, and provide medical facilities and opportunities for higher education not available in the smaller rural communities.

The existing Amtrak railroad corridor between Chicago and St. Louis, shown in Exhibit 2.0-1, is 284 miles long, the majority of which has a single track. As shown in Table 2.3-1, the number of tracks varies by the ownership arrangements on each line section. Existing land use in the study corridor is described by county in Section 4.1.2.

4.1.2 Existing Land Use Description by County

4.1.2.1 Cook County

The existing Chicago to St. Louis Amtrak route (Section 1, Exhibit 3.3-10) operates on Amtrak and Canadian National (CN) tracks from Union Station in Chicago's downtown for approximately 27 miles in Cook County, passing through Chicago and older Chicago suburbs, including Cicero, Forest View, Summit, Bedford Park, Willow Springs, and Lemont. Metra commuter rail stations are located in Summit, Willow Springs, and Lemont; Chicago to St. Louis Amtrak service also stops at the station in Summit.

Heavy industrial land use is predominant along the tracks in Cook County between Chicago and Lemont. In Lemont, the railroad passes through the central business district. Lemont's business core was originally stimulated by rail service and access to the Illinois and Michigan Canal. The central business district in Lemont continues to provide a mixture of retail commercial, institutional, and recreational land uses in proximity to the railroad.

The Rock Island District (Section 2) extends from downtown Chicago for approximately 26 miles, passing through Chicago and other Chicago suburbs, including Blue Island, Robbins, Midlothian, Oak Forest, and Tinley Park. Land use along the northern part of this section is heavily industrial, with some mixed commercial and urban residential neighborhoods adjacent to the study corridor. It runs near or adjacent to Interstate 90 for approximately five miles. At the southern end of this section, land use becomes more mixed retail/commercial and residential with several parks and forest preserves adjacent to the existing railway (see Section 4.15, Exhibit 4.15-1).

4.1.2.2 Will County

In Joliet, the existing Amtrak route switches from the CN to the Union Pacific (UP) tracks. The existing route extends for approximately 33 miles in Will County, passing through Romeoville, Lockport, Joliet, Elwood, Wilmington, Braidwood, and Godley. The Rock Island District (RID) extends for approximately 14 miles in Will County, passing through Mokena, New Lenox, and Joliet.

The existing Amtrak route passes through the center of communities whose business core was originally stimulated by rail service and access to the Illinois and Michigan Canal. The central business districts in Lockport, Joliet and Elwood continue to provide a mixture of retail commercial, institutional, and recreational land uses in proximity to the railroad. South of Joliet, outside of the incorporated areas of Wilmington, Braidwood, and Godley, most of the land use adjacent to the tracks is agricultural.

South of Elwood, the railroad passes through Midewin National Tallgrass Prairie, formally the Joliet Arsenal. The Midewin National Tallgrass Prairie is a 16,000-acre prairie parkland, established in 1996. It serves as both a nature preserve and a recreational open space with biking and hiking trails. It is the first national tallgrass prairie in the country and one of the newest units of the National Forest System (USDA, 2011). The Joliet Arsenal redevelopment plan also includes construction of a 910-acre National Veteran's Cemetery on the west side adjacent to the railroad; two industrial parks; and a 425-acre county landfill (Joliet Arsenal Development Authority, 2011).

An additional special area in this county is the Braidwood Nuclear Generating Station, located immediately southeast of Braidwood. Some roadways that serve this facility cross the railroad and are designated emergency evacuation routes (Exelon Corporation, 2011).

4.1.2.3 Grundy County

The study corridor extends for approximately 12 miles in the southeast corner of Grundy County. Most of the land adjacent to the track is used for agriculture in this county. However, it also passes along the edge of Braceville and through the center of Gardner. Residential development occurs along the Union Pacific in Braceville. In Gardner, numerous institutional and commercial uses, as well as a grain elevator, are situated along the railroad.

4.1.2.4 Livingston County

The study corridor extends for approximately 30 miles in Livingston County, passing through the communities of Dwight, Odell, Cayuga, Pontiac, and Ocoya. Both the Village of Dwight and the City of Pontiac serve as regional centers for the Grundy-Livingston County agricultural area. Outside of the urbanized areas, the railroad passes through agricultural areas.

The study corridor passes through a mixed commercial and residential area in the downtown areas of the Village of Dwight and the City of Pontiac, with some industrial land use on the outer edges of these urbanized areas. The City of Pontiac, located towards the center of the county, is an important regional trading center with a blend of agriculture, manufacturing, and service industries. Heartland Community College and St. James Hospital are among the facilities which distinguish Pontiac from the smaller rural communities (Greater Livingston County Economic Development Council, 2011).

4.1.2.5 McLean County

In McLean County, the study corridor extends for approximately 43 miles through the center of the Town of Normal and the City of Bloomington, contiguous communities which together function as an urbanized regional center. The study corridor also passes through unincorporated agricultural areas and rural communities, including Chenoa, Lexington, Towanda, Funks Grove, and McLean.

Chenoa, Lexington, and Towanda are located north of the Bloomington-Normal area. Single-family residential and commercial land uses, including those related to agriculture, are generally located within the study corridor in these communities.

Land uses in the Bloomington-Normal area reflect the area's economic strength in education, insurance, agribusiness, and industry (Bloomington-Normal Area Convention and Visitors Bureau, 2011). The Illinois State University campus is on the west side of the tracks in central Normal and includes university facilities and student housing within walking distance to the Normal Amtrak station.

Funks Grove and McLean are located south of Bloomington-Normal in McLean County. Land use in the Funks Grove area within the study corridor consists mainly of forested areas. However, there is some commercial land use near the railroad tracks in Funks Grove. The Funks Grove Pure Maple Sirup Company, located in Funks Grove Township has been in operation since 1891. Access to Old U.S. Route 66 is provided by a private grade crossing from this enterprise. This private crossing is used to transport sap. During the spring season, this crossing is actively used.

The study corridor passes through the center of McLean, an agricultural community of about 800 residents. McLean has mixed land use, including a downtown area with several historic buildings and a restored train depot that houses an antique shop (Illinois Route 66 Scenic Byway, 2011).

4.1.2.6 Logan County

The study corridor extends for approximately 27 miles in Logan County and passes through several rural communities, including Atlanta, Lawndale, Lincoln, Broadwell, and Elkhart. The City of Lincoln is the largest municipality in Logan County. In addition to residential areas, the city is occupied by government facilities, educational institutions, and commercial and industrial land uses.

More than 95 percent of the County's 618 square miles are in active agricultural use, utilizing the area's fertile soil and open topography. In the unincorporated agricultural areas, there are isolated agricultural and industrial facilities adjacent to the railroad. These facilities are generally located near a rail crossing providing access to Old U.S. Route 66 and Interstate 55. Land uses in Logan County are predominantly agriculture, with scattered wooded riparian greenways (Logan County Regional Planning Commission, 2006).

The Lincoln and Logan Correctional Facilities are located approximately two miles south of Lincoln. The Township Route (TR) 128 highway-railroad grade crossing is the only crossing used to access these facilities from the west. The 974-acre Edward R. Madigan State Fish and Wildlife Area is north of the correctional facilities and generates seasonal traffic on Business Route Interstate 55 and the TR 128 rail crossing (Logan County Regional Planning Commission, 2006).

4.1.2.7 Sangamon County

The study corridor extends for approximately 34 miles in Sangamon County, passing through the City of Springfield, the current capital of Illinois and the county seat of Sangamon County, and the rural communities of Williamsville, Sherman, Chatham, Auburn, and Thayer. Outside of Springfield, land uses along the study corridor in Sangamon County are characteristic of those in predominantly agricultural areas (Springfield-Sangamon County Regional Planning Commission, 2009).

Land uses in Springfield are generally mixed industrial, commercial, and residential, with a high concentration of government buildings and businesses in the downtown district (Springfield-Sangamon County Regional Planning Commission, 2000). The Springfield train station is also located in the downtown district. The concentration of historic sites, government institutions, and research and conference facilities generate high levels of tourist activity near the study corridor in Springfield. President Abraham Lincoln lived in Springfield from 1837 until he went to the White House in 1861. Major tourist attractions in Springfield include several historic sites connected with Lincoln, such as the Lincoln Home National Historic Site located at 426 South Seventh Street and the Lincoln-Herndon Law Office State Historic Site located at 6th & Adams Streets.

The land use adjacent to the proposed Section 4 study corridor includes more of the downtown district, the State Capitol Complex, and the Mid-Illinois Medical District, with intermixed residential development, while Section 5 passes through the eastern edge of downtown Springfield, less residential area than Section 4, and a warehouse and

industrial area. However, Section 5 has a larger area of proposed new right-of-way than Section 4.

4.1.2.8 Macoupin County

The study corridor extends for approximately 41 miles in Macoupin County, passing through mostly agricultural areas, as well as rural communities, including Virden, Girard, Nilwood, Carlinville, Plainview, and Shipman (Carlinville Community Chamber of Commerce, 2012). As the county seat, Carlinville serves as a regional center for Macoupin County.

4.1.2.9 Jersey County

The study corridor extends for less than three miles in unincorporated areas in the southeast corner of Jersey County. Land use is predominantly agricultural, but there is some single-family residential land use.

4.1.2.10 Madison County

The study corridor extends for approximately 27 miles in Madison County, passing through urbanized, incorporated communities with heavy industrial uses (Madison County Planning and Development Department, 2000). The Lewis and Clark Community College in Godfrey, the Alton Square Shopping Center in Alton, and the Explorer Pipeline Company in Hartford, each located adjacent to the railroad, represent the diversity of land uses within Madison County (Riverbend Growth Association, 2012). Small agricultural fields remain active in the unincorporated areas.

Traveling south from Alton, the adjacent land use becomes increasingly industrial, comprised of petroleum tank farms, refineries, and rail yards located in East Alton, Wood River, and Hartford. Small parcels of farmland, located between tank farms, occur in East Alton and Hartford. Larger farmland parcels are present farther south in the unincorporated area between Hartford and Granite City.

In the southerly portion of Madison County, the study corridor parallels Illinois Route 3 into St. Clair County. The area adjacent to the railroad is vacant land.

4.1.2.11 St. Clair County

The study corridor extends for approximately four miles in St. Clair County, passing through the City of East St. Louis. As at the southern end of Madison County, the study corridor parallels Illinois Route 3 into East St. Louis. The area adjacent to the railroad is vacant land surrounding transportation infrastructure.

4.1.2.12 City of St. Louis

The study corridor extends for approximately two miles in the City of St. Louis. The railroad is located just south of the St. Louis downtown area. Land use along the study corridor in the City of St. Louis is primarily industrial, with some commercial land uses. Many of the buildings along this portion of the study corridor are vacant.

4.2 Socioeconomic and Environmental Justice Community Characteristics

4.2.1 Demographics

The proposed study corridor includes portions of the Chicago-Joliet-Naperville Metropolitan Statistical Area (MSA), Bloomington-Normal, IL MSA, Springfield, Il MSA, and St. Louis, MO-IL MSA (Exhibit 4.2-1). The term MSA is used to describe a geographical region with at least one urban core with a population of 50,000 or more with adjacent territory that has a strong economic, social, and cultural tie to the core.

Cook, Grundy, and Will counties are all part of the Chicago-Joliet-Naperville MSA. The collective population of this MSA is 9,461,105 with 55 percent residing in Cook County, seven percent in Will County, and less than one percent in Grundy County (USCB, 2010). Between 2000 and 2008, Cook County experienced a three percent decline in population while both Grundy and Will County grew on average 34 percent. The suburban increases around Chicago are a result of the movement of Hispanics into those areas (State Journal Register, 2011).

Sangamon and McLean County both have populations of 150,000 to 200,000 people with most of the residents living in a central populated community. Approximately 76 percent of McLean County residents live in Bloomington-Normal while nearly 59 percent of Sangamon County's residents are in Springfield. McLean County's population grew nearly 13 percent between the 2000 and 2010 U.S. Census, possibly because of the stable white collar economy (State Journal Register, 2011). Since 2000, Sangamon County population has increased by nearly five percent.

Both Livingston and Logan counties are small, rural counties with approximately 38,000 and 30,000 residents, respectively. Livingston's largest community is Pontiac (11,931) while Logan's largest community is Lincoln (14,504). Both counties experienced a decline in population since 2000.

Jersey, Macoupin, Madison, St. Clair, and St. Louis counties are all part of the St. Louis MSA. All of the counties, except St. Louis, experienced four to six percent population growth between 2000 and 2010. Jersey and Macoupin counties would be considered more rural, each with populations of less than 50,000. St. Louis County is the most populated with nearly 1.3 million people. Madison County has approximately 260,000 people while St. Clair County has 270,000.

4.2.2 Economics

4.2.2.1 Employment

The civilian employed population along the study corridor is nearly 3.8 million or 63 percent of the total Illinois employed population, and approximately 65 percent of that employment works in Cook County (USCB, 2006-2010). The major industrial sector along the study corridor is in education, healthcare, and social services, which employs nearly 23 percent of the population.

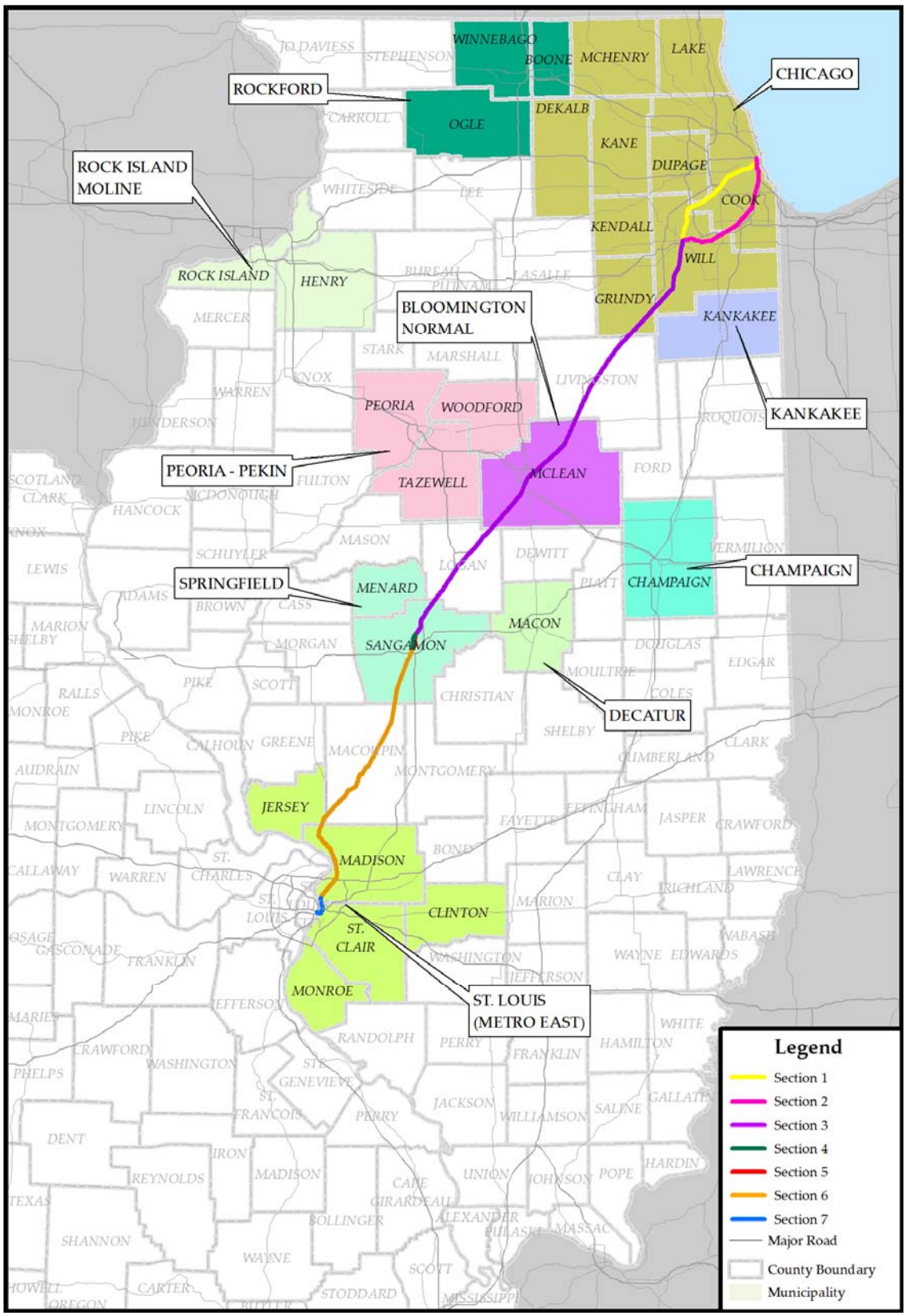


Exhibit 4.2-1. Illinois Metropolitan Statistical Areas

In the northern sector of the study corridor, Cook County has the largest and most diversified economy based on manufacturing, printing and publishing, finance and insurance, and food processing (City Data, 2011). With a large population that can draw employees from surrounding Will and Grundy counties as well as an inland port, Chicago serves as a transportation and distribution center. The top six major employers include the U.S Government, Chicago Public Schools, City of Chicago, Cook County, Advocate Health Care, and the State of Illinois (Crain Communications, 2011).

In the central portion of the study corridor, Livingston County has a strong manufacturing sector, and top employers include Caterpillar and the Pontiac Correctional Facility (ILDCEO, 2011). The economic base for McLean County is the finance and insurance sector. The headquarters for State Farm Insurance is located in Bloomington and employs over 14,000 people (EDC, 2006). Sangamon County is home to the state capital, Springfield, and state government provides the base employment for the county. Logan County, located between Sangamon and McLean counties, has approximately 70 percent of its workforce in three industry sectors: trade, transportation, and utilities; education and healthcare; and manufacturing (Lincoln and Logan County Development Partnership, 2011).

The southern section of the study corridor has five counties (Macoupin, Jersey, Madison, St. Clair, and St. Louis) in the St. Louis, IL-MO MSA. Jersey and Macoupin County are the most rural of the counties. The top employers in Macoupin County include Prairie Farms Dairy Farms, Inc., Exxon Mobil, and the school districts, and in Jersey County, the major employers are the Jersey Community Hospital, Principia College, and the Jersey school district. Much of the population and employment for Madison County is located in Edwardsville, and the top employers include the Southern Illinois University, four manufacturing companies, and two medical centers. In St. Clair County, Scott Air Force Base employs over 12,000 people. The other top employers include three healthcare systems, East St. Louis school district, and Southwestern Illinois College. St. Louis County is the most populated and industrial county in the region with manufacturing and corporate headquarters. It has a diverse workforce with top employers in healthcare, education, telecommunications, financial services, utilities, and government (RCGA, 2011).

4.2.2.2 Income

The highest median household incomes within the study area are in Will ($75,906) and Grundy ($64,297) counties followed by St. Louis and McLean counties which both have median household incomes around $58,000. Jersey and Cook counties have median household incomes around $53,000, Sangamon and Madison counties are around $52,000, and Livingston County is around $51,000. In the study area, the lowest median household incomes, all around $48,000, are in Logan, Macoupin, and St. Clair counties (USCB, 2006-2010).

4.2.3 Environmental Justice

4.2.3.1 Laws, Orders, and Regulations

On February 11, 1994, President Clinton issued EO 12898, Federal Actions to Address Environmental Justice in Minority and Low–Income Populations. The purpose of this EO is to avoid the disproportionate placement of adverse environmental, economic, social, or health impacts from federal actions and policies on minority and low-income populations or communities.

The U.S. Department of Transportation Order on Environmental Justice (Federal Register: May 10, 2012 [Volume 77, Number 91]) states that environmental justice is the requirement that federal agencies address, to the greatest extent practicable and permitted by law, the potential disproportionately high, adverse human health and environmental impacts of their programs, policies, and activities on minority and low-income populations. The HSR Program will follow existing policies designed to implement EO 12898, namely the National Environmental Policy Act (NEPA), Title VI of the Civil Rights Act of 1964 (Title VI), the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (URA), and other DOT applicable statutes, regulations and guidance that concern planning; social, economic, or environmental matters; public health or welfare; and public involvement.

4.2.3.2 Low-Income and Minority Populations

Detailed information regarding minority populations in the study corridor was compiled at the Census Block Group Level from the 2010 Census and low-income data was compiled at Census Tract Level from the Census 2010 American Community Survey (5-yr estimates). Low-income, i.e., at or below the poverty threshold, is defined as a family of four having an aggregate annual mean income at or below $22,314 in 2010 (Census, 2010). Low-income percentages in the study corridor census tracts range from 0 to 85 percent. Minority data is obtained from the Census and includes all individuals who identified their race as Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian and other Pacific Islander, or two or more races (Census, 2010). Minority percentages in the counties along the study corridor block groups range from 0 to 100 percent. A minority or low income population for this Tier 1 FEIS is defined as a community of concern if it meets either or both of the following criteria: The census block contains 50 percent, or more, minority persons and/or the census block group contains 50 percent, or more, low-income persons.

Table 4.2-1 shows the number of block groups or census tracts within a one-mile study corridor along each section of the alignment and identifies the number that have either 50 percent of the population that is a minority or below the poverty line. Approximately 283 block groups within the one-mile corridor of the proposed sections have minority populations greater than 50 percent minority while 18 census tracts have poverty rates greater than 50 percent. The highest concentrations of minority populations and those in poverty are in the dense urban areas around Cook County and Will County and areas in East St. Louis /Downtown St. Louis.

Table 4.2-1. Environmental Justice Populations

Section	Census Tracts		Census Block Groups	
	Total	Populations Below Poverty Line (>50%)[1]	Total	Minority Populations (>50%)[2]
1	76	2	147	62
2	129	11	275	175
3	42	2	141	13
4	14	0	33	3
5	17	0	35	9
6	44	0	90	5
7	13	3	20	16

Source: U.S. Census Bureau, 2010

[1] Tracts in this column have 50 percent or more of the population below the poverty line.

[2] Block groups in this column have 50 percent or more of the population identified as a minority.

4.2.4 Community Services and Facilities

Schools, medical centers, churches, fire stations, police stations, and recreational areas serve the daily needs of the residents. Table 4.2-2 shows the number of schools, hospitals, and churches that are within the one- mile corridor along each section of the alignment. Fire stations and police stations are located within all the communities, and it is anticipated that their service routes would include all roads and crossings within the sections. The district boundaries for public services extend beyond the limits of municipalities and covers vast agricultural areas. Typically, municipal governments would be responsible for those services within the communities while the county would manage services outside of communities. Access to and from the facilities plays a critical role in providing these resources. Current railroad lines do not limit or restrict access. Furthermore, there has been past coordination to make sure that public services are not affected by crossings and blocked crossings are minimized.

Table 4.2-2. Community Facilities

Section	Schools			Churches	Hospitals
	College	Public School	Private School		
1	2	34	14	79	1
2	7	86	33	278	3
3	1	41	11	75	10
4	3	6	2	3	2
5	3	7	2	2	1
6	1	28	6	49	1
7	1	5	0	17	0

Source: ESRI ArcGIS 10 Online Data

4.3 Energy

Current energy consumption by the four basic transportation modes — rail, automobile, bus, and air — used for intercity travel in the study corridor was calculated for this program. Because each of the four modes uses a different type of fuel, comparison of the energy consumed by each required conversion to a common base unit. The British Thermal Unit (BTU) was the measure used to compare the total annual energy consumed by each mode.

The following energy consumption rates were used to calculate annual consumption for each of the four transportation modes.

- Rail: 1,745 BTUs per passenger-mile
- Automobile: 3,501 BTUs per passenger-mile
- Bus: 2,656 BTUs per passenger-mile
- Air: 2,931 BTUs per passenger-mile

These rates were taken from the following Research and Innovative Technology Administration, Bureau of Transportation Statistics website (http://www.bts.gov/publications/national_transportation_statistics/2010/html/table_04_20.html) and are based on the year 2008 data, which is the last year that data was available. These consumption rates indicate that rail travel is the most energy efficient mode of transportation.

To determine the total BTUs consumed for each mode, the BTU rates were calculated by the corresponding annual passenger-miles from the year 2010 (Table 4.3-1). As shown in the table, the rail system consumes approximately 0.7 percent of all energy used for intercity passenger service in the study corridor while serving 1.7 percent of all passenger-miles of travel.

Table 4.3-1. Existing Annual Passenger-Miles of Travel and Energy Consumption

Mode	Passenger-Miles (millions)	Percent of All Four Modes	Energy Consumption (billions of BTUs)	Percent of All Four Modes
Rail	114	1.7	199	0.7
Automobile	6,499	95.8	27,754	97.6
Bus	26	0.4	69	0.3
Air	140	2.1	411	1.4
Total	6,779	100.0	28,433	100.0

4.4 Agriculture

The State of Illinois is an agricultural state. Seventy-two percent of the State of Illinois' land area is utilized as farmland for the production of crops, timber, or livestock (USDA, 2007). With the exception of the urbanized metropolitan areas of Chicago and St. Louis, agriculture is the primary land use along the study corridor. Of the 12 corridor counties in Illinois, farmland accounts for over 90 percent of the total county land area in Livingston and Sangamon counties, and over 80 percent of the total land area in four others (Grundy, Jersey, Logan, and McLean).

The Farmland Protection Policy Act, enacted in 1981 and finalized in 1994, was established to minimize unnecessary and irreversible conversion of farmland to non-agricultural uses. It also ensures these projects are compatible with state, local, and private efforts to preserve farmland. It is administered by the US Department of Agriculture Natural Resources Conservation Service and applies to construction projects funded in part or entirely by the federal government. The act identifies "prime farmland soils" as soil types that comprise the best physical and chemical characteristics for the production of food and other agricultural crops with minimal use of fuel, fertilizer, pesticides, and labor, as well as minimal erosion. Land not actively farmed can be classified as "prime farmland" but land in urban development or used for water storage may not be classified as such. Prime farmland soils in the counties along the proposed study corridor are listed in Appendix B. Soil data for Cook, Madison, St. Clair, and St. Louis counties are not included in this appendix. These counties were excluded

because the study corridor is completely within urban boundaries, thus exempting the soils here from consideration under the Farmland Protection Policy Act.

Prime farmland soils along the study corridor are shown on Exhibits 4.4-1 through 4.4-3. The study corridor illustrated in these exhibits is one mile wide (half a mile on either side of the section alignments).

4.5 Cultural Resources

Cultural resources include historic and pre-historic resources that are listed or eligible for listing on the National Register of Historic Places (NRHP). Section 106 of the National Historic Preservation Act requires federal agencies to take into account the effects of their undertakings, including licensing and approvals, on historic properties and to afford the Advisory Council on Historic Preservation (ACHP) and other interested parties a reasonable opportunity to comment. Sites listed or eligible for listing on the NRHP are also subject to Section 4(f) of the U.S. Department of Transportation Act. Additional information about Section 4(f) is provided in Section 4.15.

An integral part of the Section 106 process is the delineation of the area within which archaeological and architectural resources would be affected or are likely to be affected. The Area of Potential Effect (APE) as defined by 36 CFR 800.16(d) represents "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties [i.e., NRHP-eligible resources], if any such properties exist. "

For the purposes of assessing effects through the Section 106 review process, direct effects include, but are not limited to, areas of construction resulting in the partial or complete demolition of NRHP-eligible buildings or structures or the physical disturbance of NRHP-eligible archaeological resources. Indirect effects include, but are not limited to, visual, audible, or atmospheric effects, which alter the character or use of any of the physical aspects of integrity which contribute to the resource's ability to meet the criteria for listing in the NRHP. For this Tier 1 evaluation, the APE was established as a 500-foot wide corridor (250 feet to either side) along each section of the alignment under consideration, based on the potential for direct or indirect impacts. This APE may be revised for Tier 2 studies as additional details are developed.

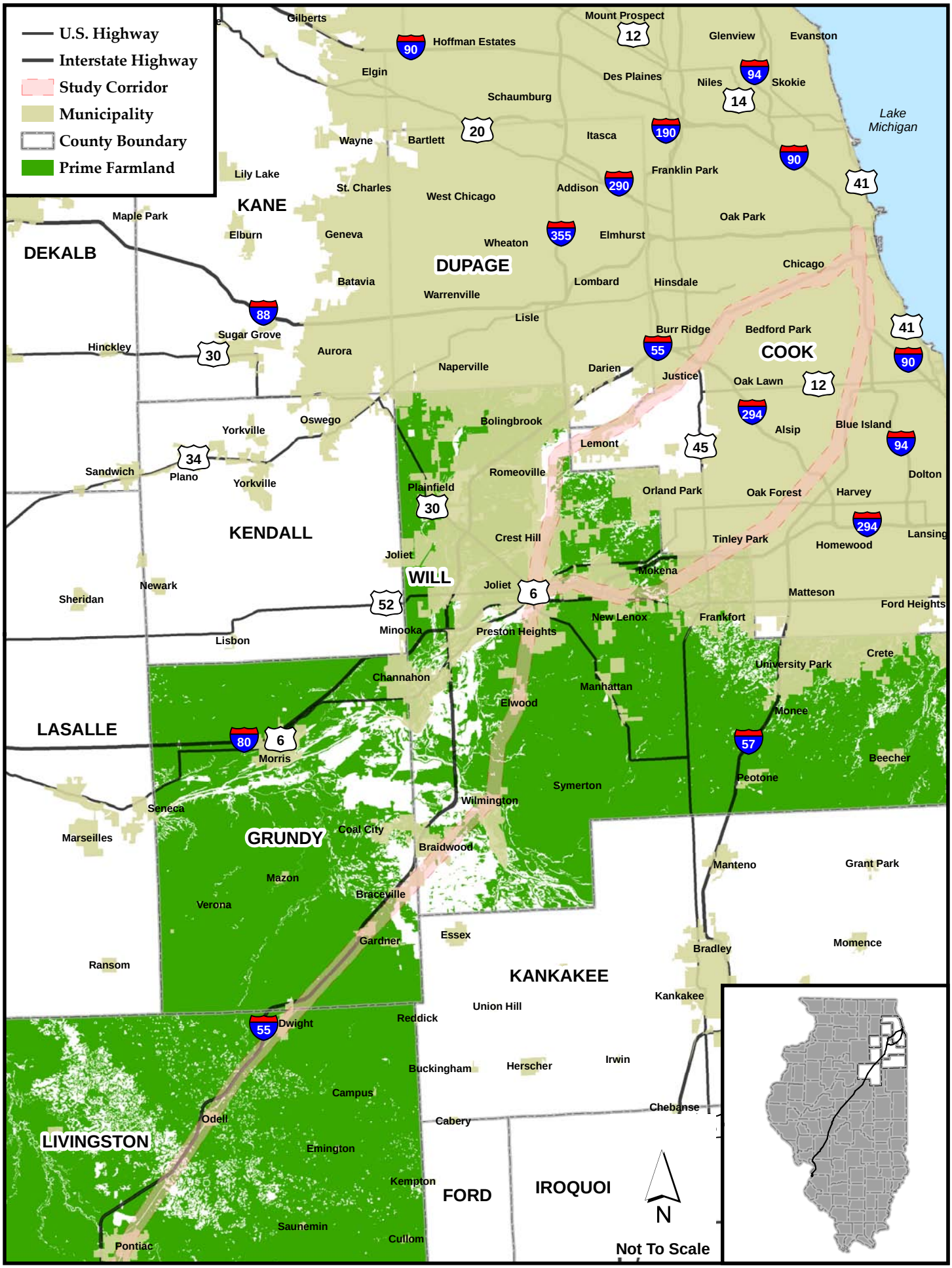


Exhibit 4.4-1. Prime Farmland Soils (1 of 3)

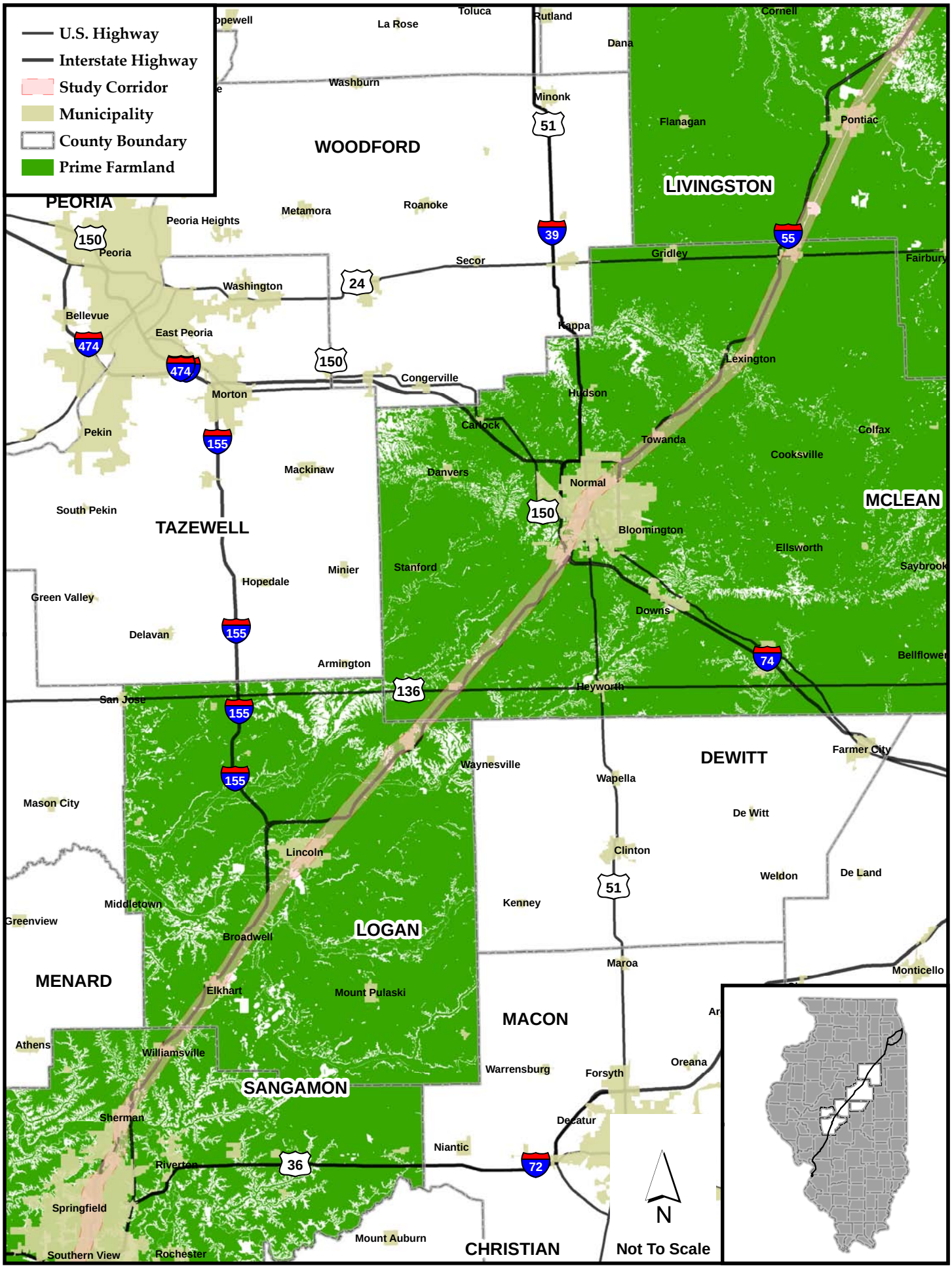


Exhibit 4.4-2. Prime Farmland Soils (2 of 3)

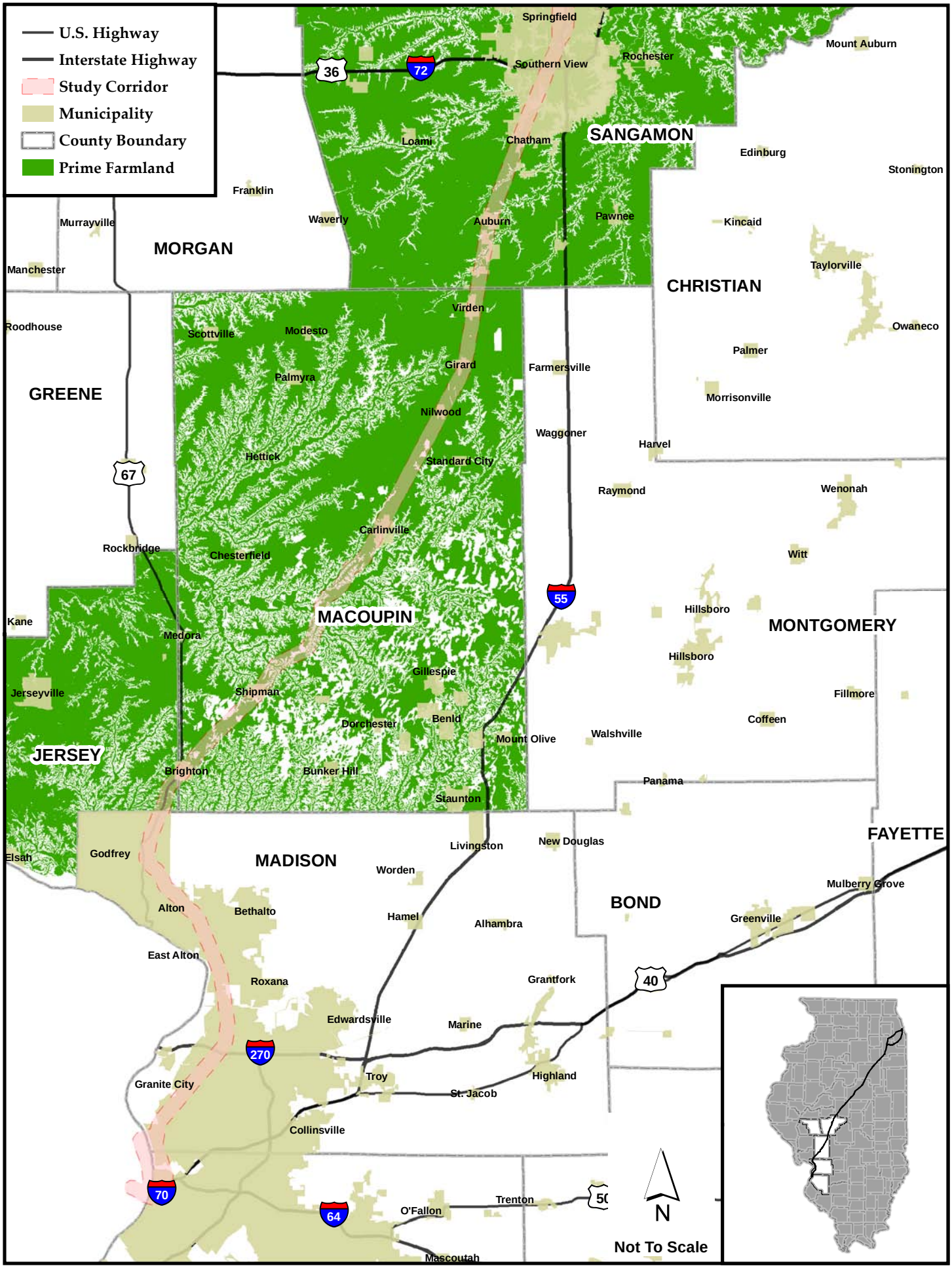


Exhibit 4.4-3. Prime Farmland Soils (3 of 3)

4.5.1 Historic Architectural Resources

Historic architectural resources include previously identified above-ground resources such as buildings, sites, structures, and historic districts. Properties located within 250 feet of the existing railroad alignments that may qualify for protection under Section 106 were identified. GIS data was obtained from National Park Service and Illinois Historic Preservation Agency (http://www.state.il.us/hpa/ps/haargis.htm) websites for properties listed or determined eligible for listing on the NRHP that are within this corridor. Thirty-five NRHP-eligible and NRHP-listed resources were identified and are listed in Table 4.5-1 and shown on Exhibit 4.5-1. During Tier 2, field surveys would be conducted in areas of construction to identify additional sites that may be eligible for listing on the NRHP.

Table 4.5-1. NRHP and NRHP-Eligible Resources within 250 Feet of Alignments

Resource	City/County	Section	NRHP Status
Union Station – 210 S Canal Street	Chicago/Cook	1,2	Eligible
United States Post Office – 433 W Van Buren Street	Chicago/Cook	1,2	Listed
Illinois & Michigan Canal	Joliet/Will	1	Listed; National Historic Landmark
Lockport Historic District	Lockport/Will	1	Listed
Gaylord Building – 200 West 8th Street	Lockport/Will	1	Listed
Joliet Steel Works – 927 Collins St	Joliet/Will	1	Listed
Old Joliet Prison/Illinois State Penitentiary – 1125 Collins Street	Joliet/Will	1	Eligible
U.S. Post Office – 150 North Scott Street	Joliet/Will	1	Listed
Union Station – 50 East Jefferson Street	Joliet/Will	1, 2	Listed
The Yale – 6565 South Yale Avenue	Chicago/Cook	2	Listed
Hamilton Park – 513 West 72nd Street	Chicago/Cook	2	Listed
Raymond M. Hilliard Center Historic District	Chicago/Cook	2	Listed
Karl Vogt Building – 6811 Hickory Street	Tinley Park/Cook	2	Listed
Joliet East Side Historic District	Joliet/Will	2	Listed
Joliet Township High School – 201 East Jefferson Street	Joliet/Will	2	Listed
Route 66, Joliet to Wilmington	Will	3	Listed

Table 4.5-1. NRHP and NRHP-Eligible Resources within 250 Feet of Alignments (continued)

Resource	City/County	Section	NRHP Status
Dwight Chicago and Alton Railroad Depot – 119 West Main Street	Dwight/ Livingston	3	Listed
Illinois State Police Office (Pontiac) – 15551 Old U.S. 66	Pontiac/ Livingston	3	Listed
Route 66, Cayuga to Chenoa	Pontiac/ Livingston	3	Listed
Bridge over Rooks Creek carrying OR #66 NB	Livingston	3	Eligible
Matthew T. Scott House – 227 1st Avenue	Chenoa/ McLean	3	Listed
John Patton Log Cabin – Keller Park	Lexington/ McLean	3	Listed
Bridge over Market Street FAU6359 carrying Southern Pacific Railroad	Bloomington/ McLean	3	Eligible
Lincoln Courthouse Square Historic District	Lincoln/ Logan	3	Listed
Atlanta Public Library – 100 SE Race Street	Atlanta/Logan	3	Listed
J.H. Hawes Grain Elevator – 301 SW 2nd Street	Atlanta/ Logan	3	Listed
John F. Bretz House and Warehouse – 1113 North 5th Street	Springfield/ Sangamon	4	Listed
Edwards Place – 700 N 4th Street	Springfield/ Sangamon	4	Listed
Susan Lawrence Dana House – 301 Lawrence Avenue	Springfield/ Sangamon	4	Listed; National Historic Landmark
Jennings Ford Automobile Dealership – 431 South 4th Street	Springfield/ Sangamon	4	Listed
Hickox Apartments – 631 South 4th Street	Springfield/ Sangamon	4	Listed
Amtrak Station – 100 S 3rd Street	Springfield/ Sangamon	4	Eligible
Illinois Department of Mines and Minerals-Springfield Mine Rescue Station – 609 East Princeton Avenue	Springfield/ Sangamon	5	Listed
Route 66, Girard to Nilwood	Macoupin	6	Listed
MacArthur Bridge	East St. Louis/St. Clair	7	Eligible

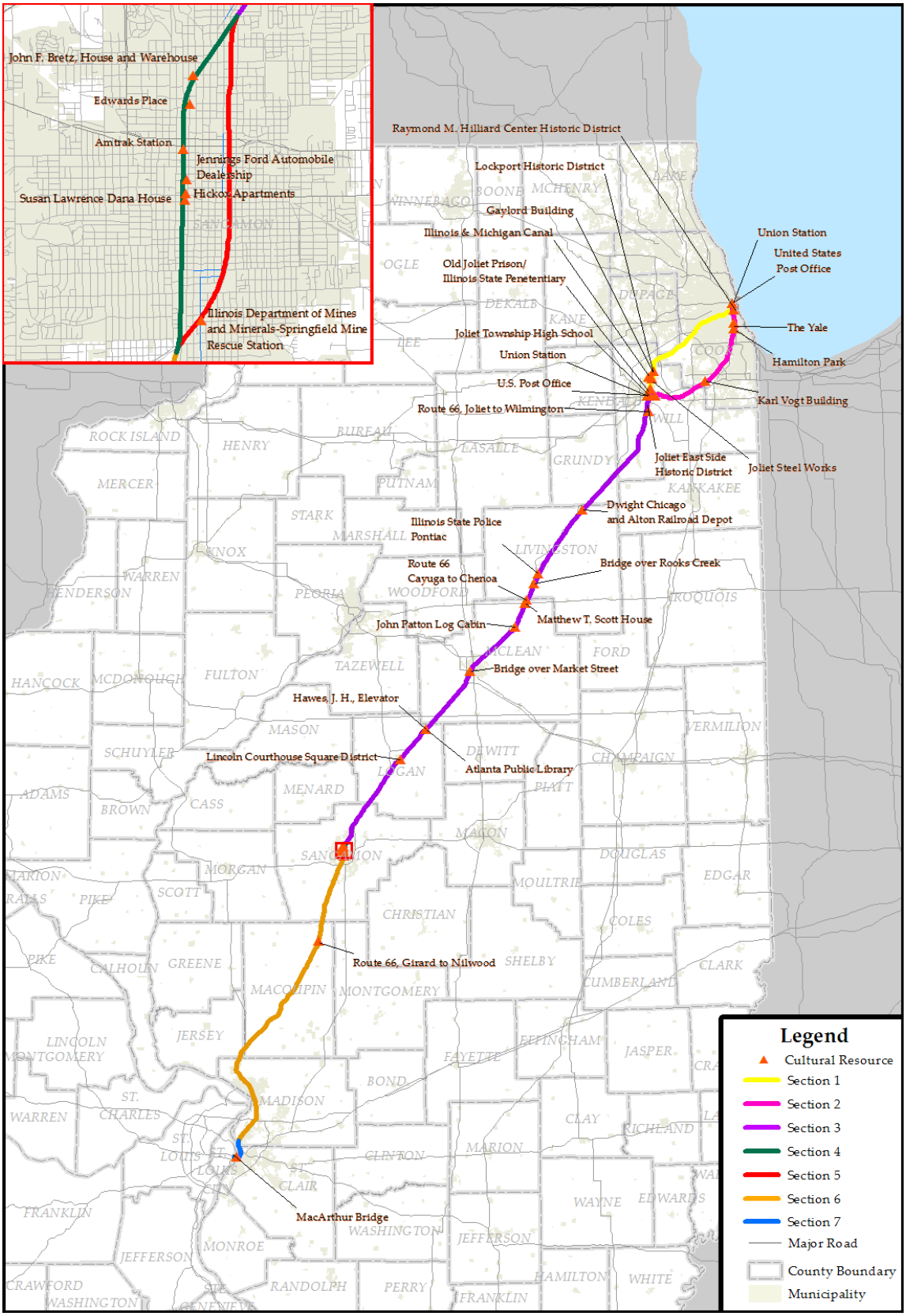


Figure 4.5-1. Historic Architectural Resources

4.5.2 Archaeological Resources

Archaeological resources include resources such as petroglyphs, pictographs, rock shelters, village sites, cemeteries, prehistoric earthworks and mounds, historic earthworks and fortifications, farmsteads, industrial sites, foundations, and ephemeral scatters of prehistoric and historic debris. The Illinois State Archaeological Survey provided GIS data for NRHP-listed sites within this corridor. Five archaeological sites were identified within the APE and are listed in Table 4.5-2. Specific locations are not provided in order to protect the integrity of the sites.

Table 4.5-2. Previously-Identified NRHP-listed Archaeological Sites

Resource	County	Section	Site ID
Cemetery	Cook	1	11CK764
Cemetery	Will	1	11WI1186
Cemetery	Will	1	11WI70
Mound	Macoupin	6	11MP266
Mound	Macoupin	6	11MP4

4.6 Natural Resources

The study corridor used for the natural resources evaluation is one mile wide (half a mile on either side of the section alignments).

4.6.1 Geology and Soils

The study corridor is within the Central Lowland Physiographic Province. The area between Chicago and Joliet (Cook and Will counties) is within the Chicago Lake Plain and the Wheaton Morainal Country Division of the Great Lake Section of the Central Lowland Province. The Chicago Lake Plain Division is underlain by till and characterized by a very flat surface. The Wheaton Morainal Country Division contains a variety of glacial land forms with gently rolling topography. Glacial soils are found throughout the Great Lake Section. The remainder of the study corridor lies within the Till Plains Section. From Joliet to Dwight in Livingston County, the study corridor crosses the Kankakee Plain Division; from Dwight to northeast of Lincoln in Logan County, the study corridor traverses the Bloomington Ridged Plain Division; and from Logan County to St. Louis, the study corridor is in the Springfield Plain Division (Illinois State Geological Survey, 2011, http://www.isgs.illinois.edu). The Till Plains Section is topographically flat with glacial soils. These physiographic units are shown on Exhibit 4-6.1.

Glacial till deposits are found throughout the entire study corridor, and much of the surface is covered with glacial drift, which is silt, clay, sand, gravel, and boulders left behind by retreating continental glaciers. The Chicago and St. Louis areas may have less

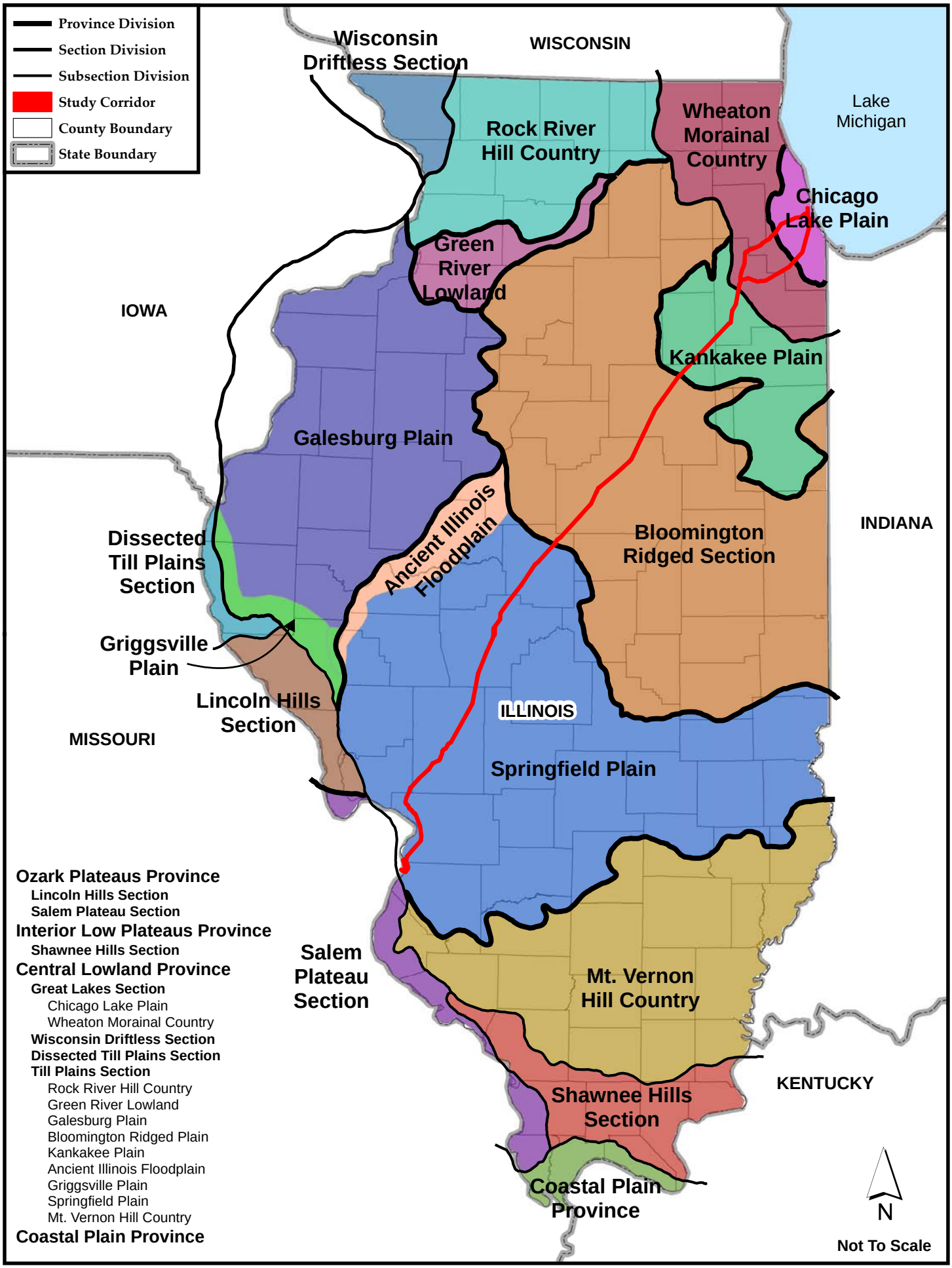


Exhibit 4.6-1. Physiographic Regions

than 25 feet of drift thickness, while drift in the central portion of the study area may be thicker than 200 feet in some places. Loess is a geologic term that refers to deposits of silt that have been transported by wind action. Extensive, thick loess deposits formed in areas bordering large continental glaciers. Loess deposits within the study area are generally up to five feet deep between Chicago and the northern boundary of McLean County. From there to St. Louis loess deposits may be ten to 20 feet thick, with some places much deeper.

Underlying bedrock in the study area is dominated by Silurian age formations in the Chicago to Joliet portion of the study area, with younger Pennsylvanian age rocks, predominantly the Shelburn-Patoka Formation and Bond Formation, from Joliet to St. Louis. These Pennsylvanian formations occur with the Illinois Basin, a northwest to southeast asymmetrical structural basin that is filled with more than 13,000 feet of Paleozoic sedimentary rocks. The basin covers most of Illinois and extends into western Indiana and western Kentucky.

A wide variety of soils are found within the study area, and most of the soils formed from loess. Productive agricultural soils characterize much of the study area outside of urban settings. Corn and soybeans are the main crops produced in agricultural areas.

4.6.1.1 Mineral Resources

The primary mineral resources within the study area include coal, crude oil, and natural gas. Existing coal mines are concentrated in southern and western Illinois, and the Eastern Interior Coal Field includes most of the study area. Madison County and southwest Jersey County have coal deposits that can be surface mined. Coal that may be deep mined is abundant in Livingston, Logan, Sangamon, Macoupin, and Madison counties.

Crude oil and natural gas production is concentrated in southeastern Illinois, although within the study area crude oil is produced from Sangamon, Macoupin, Madison, and St. Clair counties. Minor quantities of natural gas are also produced in these counties.

Seismic Risk

Seismic risk is highest in the southern tip of Illinois, which is in proximity to the New Madrid Seismic Zone noted for historic earthquake activity. Seismic risk decreases from southern to northern Illinois. Cook and northern Will counties are designated by the US Geological Survey (USGS) as having no seismic risk. From Will County to northern Madison County seismic risk is considered minor, but the remainder of Madison County has moderate risk. The St. Louis area has experienced minor earthquake damage at least twelve times in the past 200 years. Structures located in the Mississippi River floodplain will likely experience stronger ground shaking and a greater likelihood of liquefaction. Bedrock is most commonly a hard 350 million-year-old limestone in the St. Louis area. Structures built on or near bedrock, such as in the upland areas out of the floodplains, will tend to have lower levels of earthquake ground shaking (http://earthquake.usgs.gov/regional/ceus/urban_map/st_louis/index.php).

There is broad agreement in the scientific community that a continuing concern exists for a major destructive earthquake in the New Madrid Seismic Zone. Many structures in St. Louis and other communities in the central Mississippi River Valley region are vulnerable and at risk from severe ground shaking (http://earthquake.usgs.gov/regional/ceus/urban_map/st_louis/links/index.php). Within the study area, the potential for earthquake damage would be greatest in Madison County, as amplification of ground movement may occur in alluvial soils along the Mississippi River Valley.

4.6.2 Ecological Resources

4.6.2.1 Ecoregions

Ecoregion and forest descriptions were obtained from the Environmental Protection Agency's Western Ecology Division web based data sets (ftp://ftp.epa.gov/wed/ecoregions/il/il_back.pdf). Ecoregions found within the study corridor are discussed below. Mapping of Illinois' ecoregions is contained in Exhibits 4.6-2 through 4.6-4.

Illinois/Indiana Prairie

The potential natural vegetation for this ecoregion is a mosaic of bluestem prairie and oak–hickory forest. Now, only narrow corridors of riparian forest occur. Agriculture has affected stream chemistry, turbidity, and habitat. This region has been mostly converted to cropland. Corn, soybeans, and wheat are the major crops; livestock farming is also important. The steepest land is used as pastureland or hayland.

Chicago Lake Plain

The potential natural vegetation for this ecoregion is a mosaic of bluestem prairie and oak–hickory forest. Dry prairies, mesic prairies, wet prairies, sand prairies, fens, marshes, floodplain forests, and, on sandy ridges, scrub-oak forests were common prior to settlement. Now, the landscape has been mostly urbanized.

Sand Area

The potential natural vegetation for this ecoregion is a mosaic of bluestem prairie and oak–hickory forest. Now, the landscape has been mostly converted to cropland or used as pastureland. On excessively drained, low nutrient dune soils, scrub forest or pasturelands are now common. Locally, vegetation that once stabilized dunes has been removed, thereby reactivating the dunes.

Valparaiso-Wheaton Morainal Complex

The potential natural vegetation for this ecoregion is a mosaic of oak–hickory forest and bluestem prairie. Land use today is mostly growing urban and suburban developments, but wooded areas, wetlands, and pastureland are common.

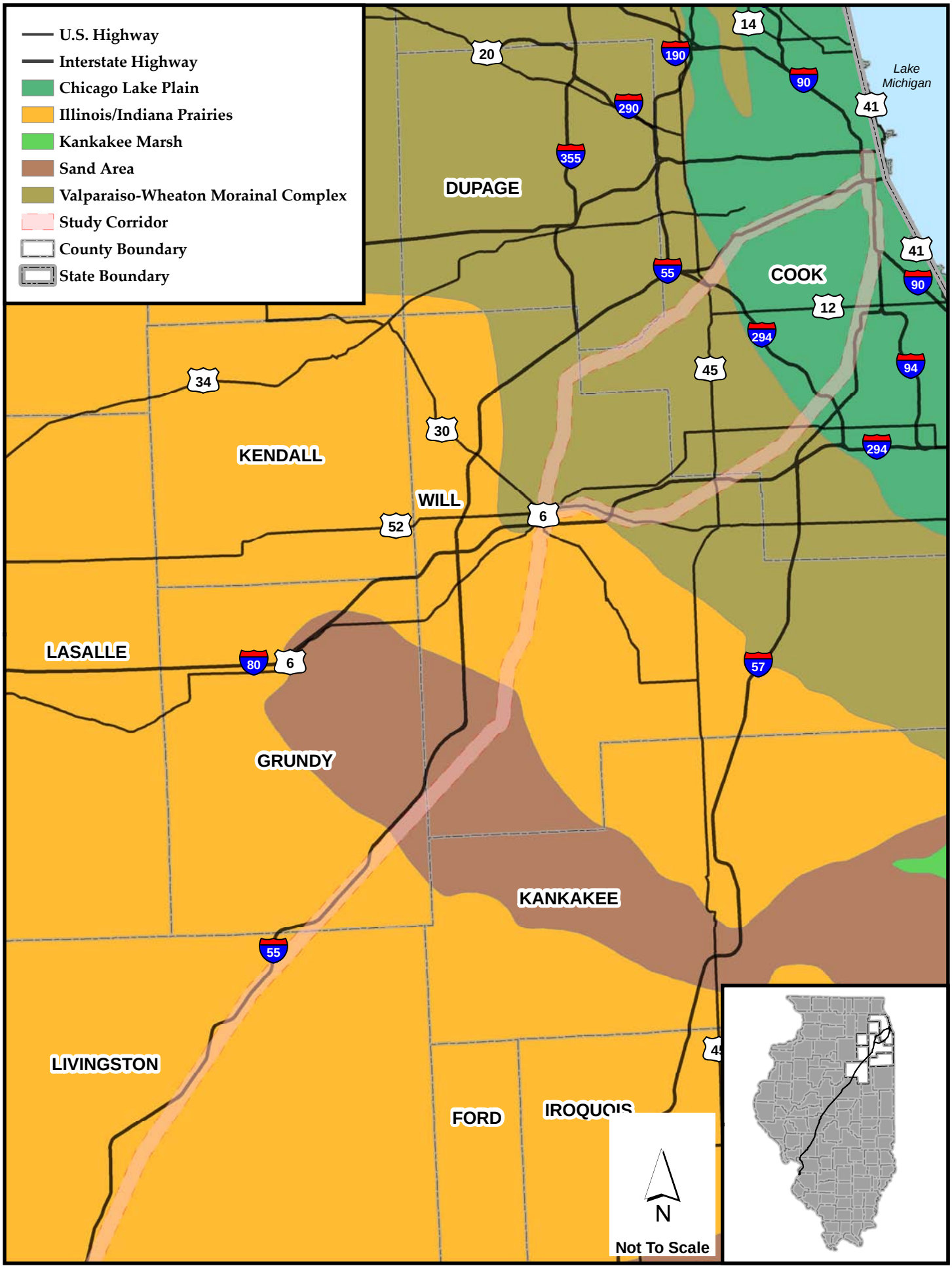


Exhibit 4.6-2. Ecoregions (1 of 3)

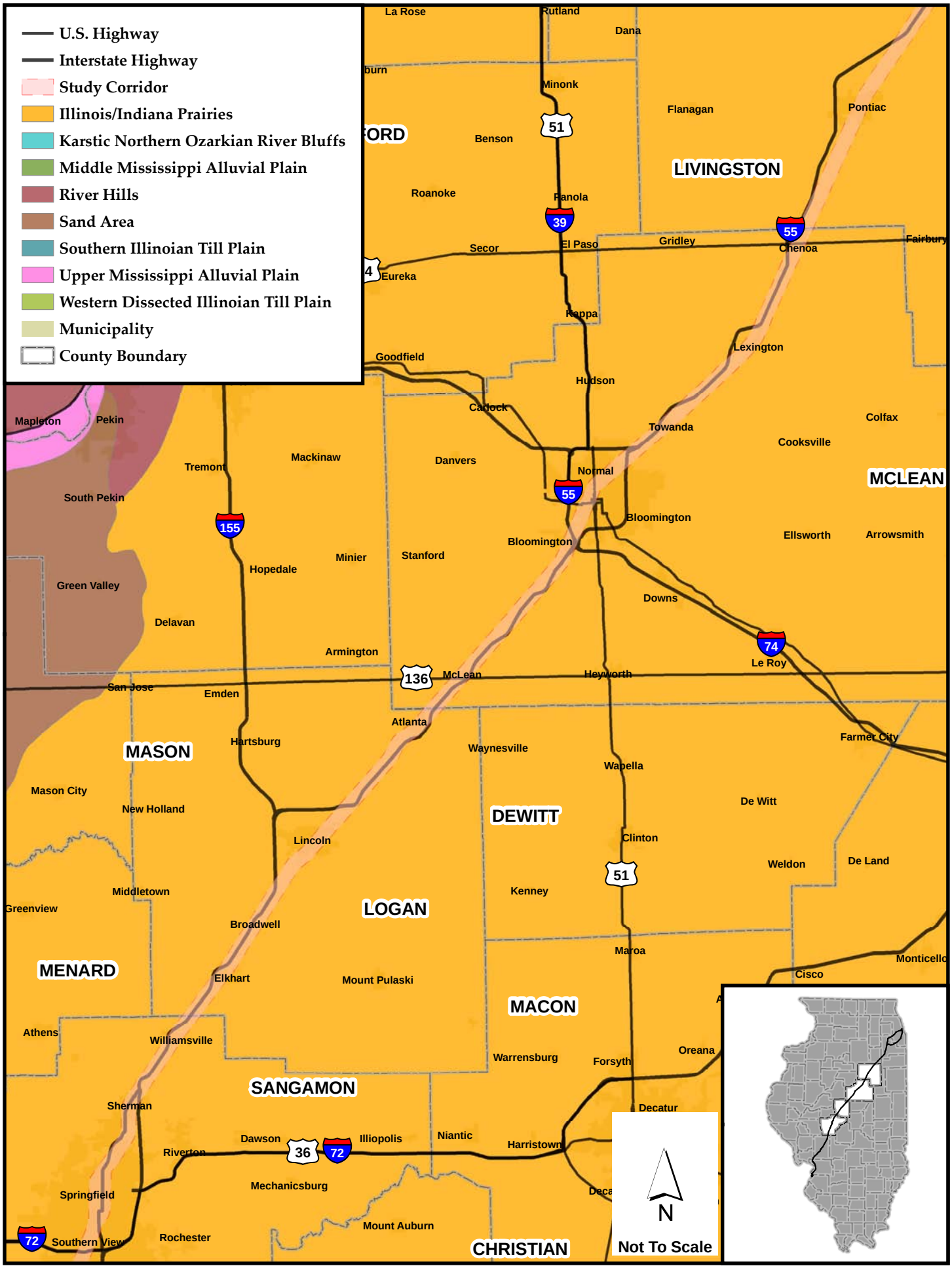


Exhibit 4.6-3. Ecoregions (2 of 3)

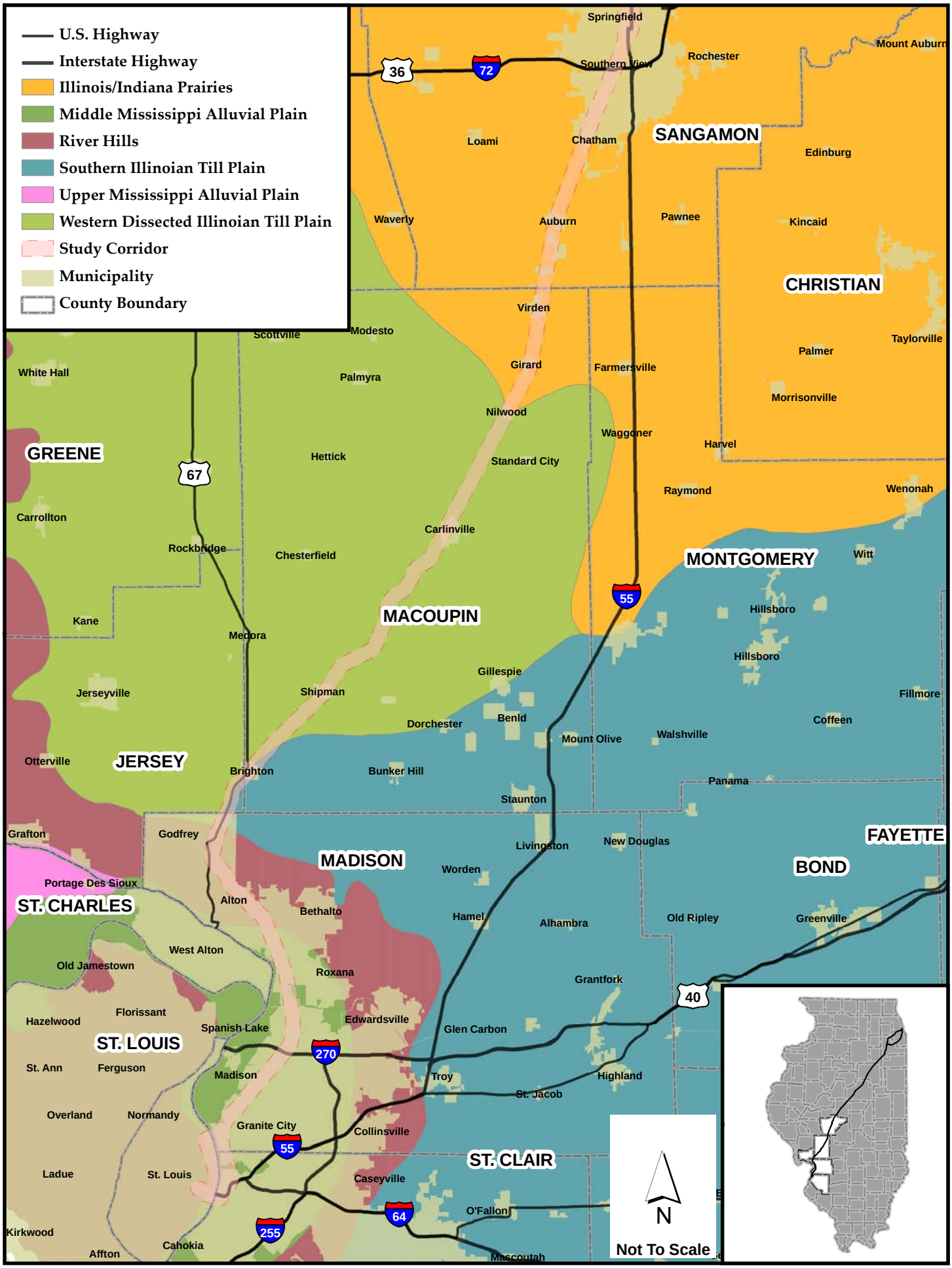


Exhibit 4.6-4. Ecoregions (3 of 3)

Middle Mississippi Alluvial Plain

The potential natural vegetation for this ecoregion is oak–hickory forest. Today nearly all of the original forests, prairies, and marshes have been drained and converted to cropland or pastureland. Main crops are soybeans, corn, and wheat. Both the alluvial plain and the river channel have been significantly modified in the last 100 years.

River Hills

The potential natural vegetation for this ecoregion is mostly oak–hickory forest or a mosaic of bluestem prairie and oak–hickory forest. Today the region remains mostly forested. National Forest land is extensive. Wooded valleys are important roosting area for wintering bald eagles. The River Hill Ecoregion is part of an important forested habitat corridor along the Mississippi River.

Western Dissected Illinoian Till Plain

The potential natural vegetation for this ecoregion is mostly oak–hickory forest or a mosaic of bluestem prairie and oak–hickory forest. Slopes and ravines remain mostly wooded. Nearly level interfluves, which were once covered by prairie, are now used as cropland or livestock farms. The main crops are corn and soybeans.

4.6.2.2 Vegetation and Habitat

The habitats within the study corridor are a mosaic of agricultural land, existing railroad right-of-way, early successional scrub-shrub habitats, small forest fragments, wetlands, riparian corridors, grasslands, and prairie remnants. The majority of the study corridor is agriculture land and existing railroad right-of-way.

Many animal species can find suitable habitat within the vegetative cover provided by the railroad right-of-way. The linear, unbroken characteristic of the right-of-way not only offers local microhabitat but also provides a continuous corridor linking a variety of habitat features. Depending on the species and the surrounding landscape, the right-of-way can provide an important habitat or their only remaining functional habitat in the surrounding area (Huijser and Clevenger, 2006). This corridor linkage can be important in areas that are dominated by agricultural and urban development. The habitat and corridor function of rights-of-way can help improve the population viability of meta-populations of certain species in fragmented landscapes (Huijser and Clevenger, 2006).

Most of the Illinois original forests were cleared for agriculture, fuel wood, fence posts, transportation, and urban and industrial development. Sixty one percent of the native flora and 75 percent of the state's wildlife habitat are found in Illinois' forests (http://dnr.state.il.us/conservation/forestry/IFDA/). Illinois forests provide habitat for more than 420 vertebrate species and over 120 bird species utilize Illinois forests for nesting (http://web.extension.illinois.edu/forestry/il_forest_facts.cfm).

The study corridor spans two ecological provinces: the Eastern Broadleaf Forest and the Prairie Parkland (Exhibits 4.6-5 through 4.6-7). The largest areas of forests are located in the center of the study corridor within the Prairie Parkland ecological province.

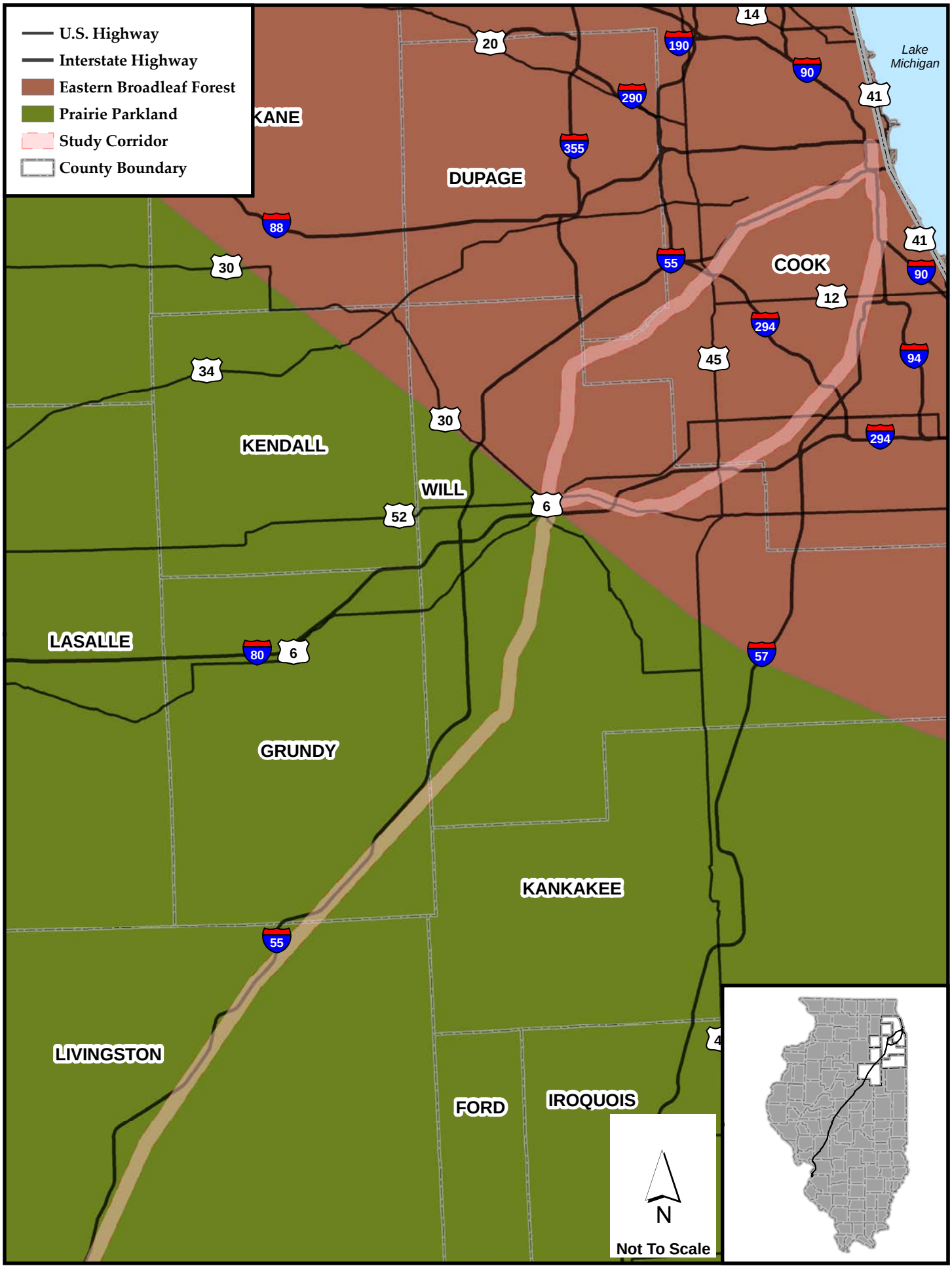


Exhibit 4.6-5. Ecological Provinces (1 of 3)

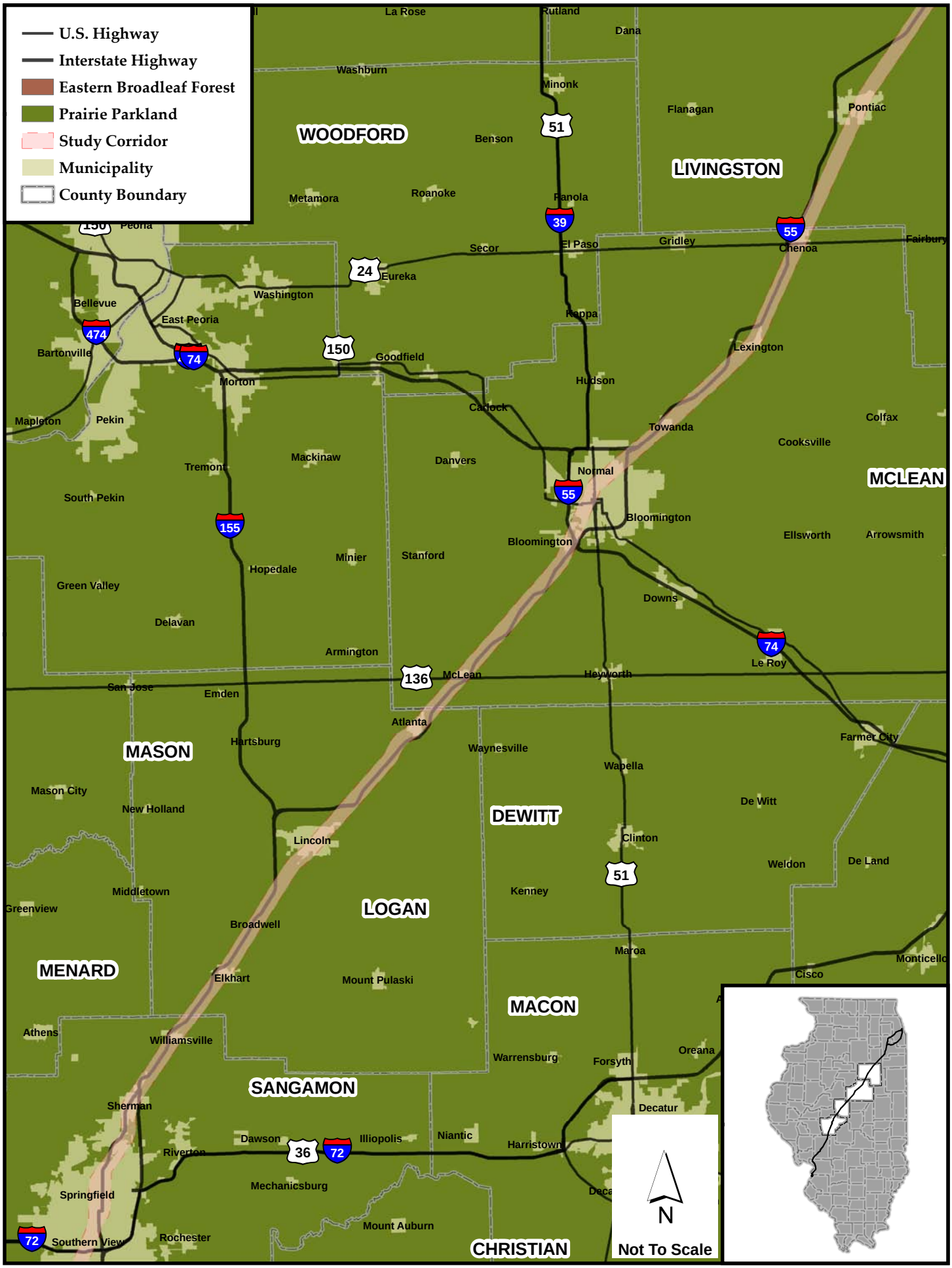


Exhibit 4.6-6. Ecological Provinces (2 of 3)

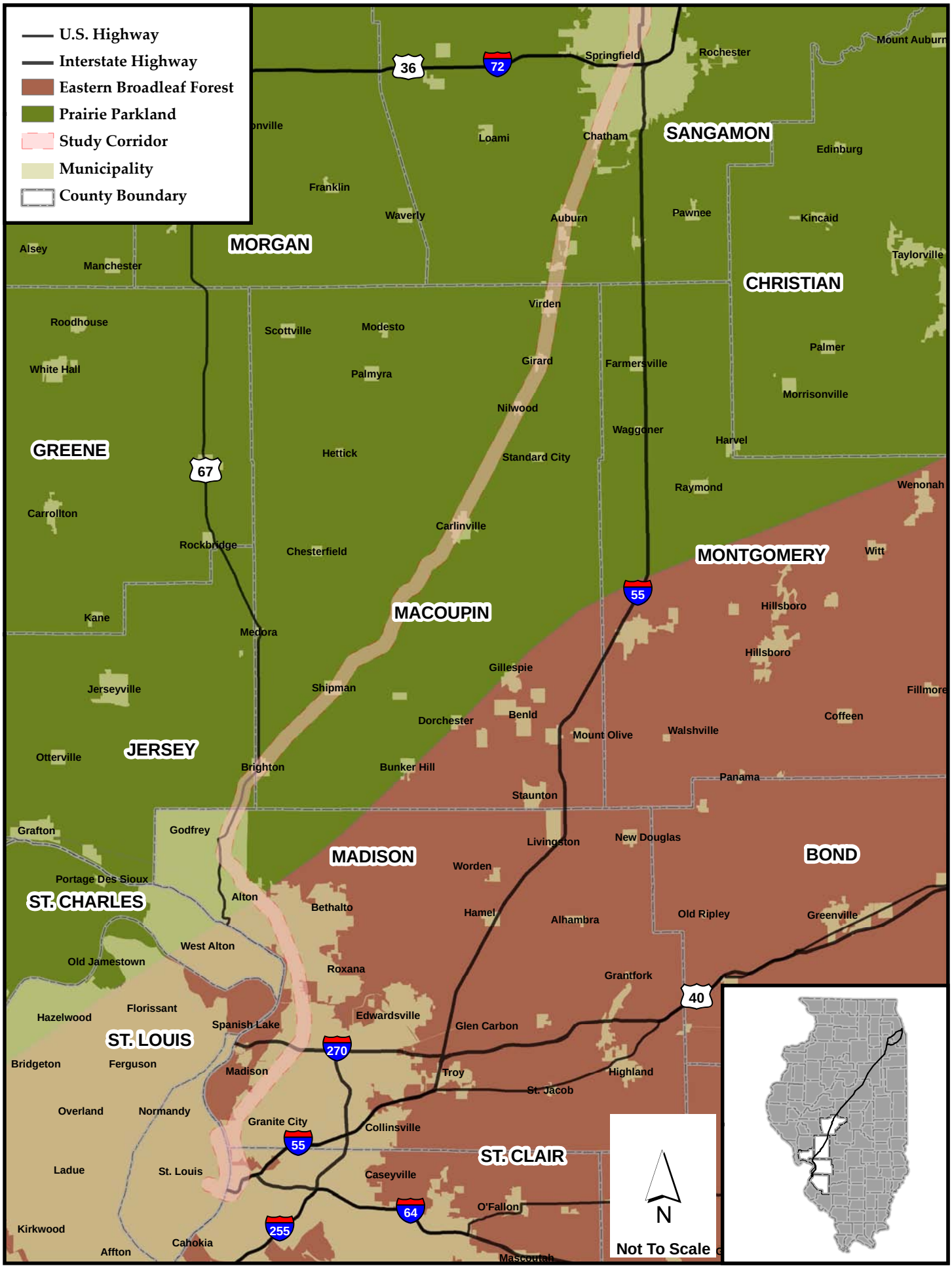


Exhibit 4.6-7. Ecological Provinces (3 of 3)

A diverse mixture of broadleaf deciduous tree species dominates the rolling hills and flat expanses of the Eastern Broadleaf Forest Province. Relatively low precipitation in the area favors the drought resistance of the oak/hickory forest-type group (Bailey, 1995).

The Prairie Parkland Province is characterized by an alternating pattern of prairie and deciduous forest. Forested portions of the province consist of uplands dominated by oak and hickory, and moist slopes and floodplains where eastern cottonwood and American elm are common species. Grasses are the predominant vegetation in prairies (Bailey, 1995).

The Illinois Nature Preserves Commission maintains a list of protected areas that are home to the state's prairie remnants (further discussion is provided in Natural Areas, Section 4.6.4.). These areas are isolated and can be found along cemeteries, roadsides, railroad tracks, hilltops and areas too wet or sandy for agriculture. Prairie remnants that are known to occur within the study corridor are shown on Exhibits 4.6-8 through 4.6-10.

4.6.2.3 Wildlife

Habitat availability, wildlife species distribution, habitat preference, and field observations (Federal Highway Administration, 2003) were used to evaluate potential wildlife within the study corridor. Given the large area encompassed by the length of the corridor, some species will only occur in small portions of the study corridor.

Birds

Some 400 bird species can be found in Illinois and more than 200 of those have been recorded as nesting in the state. Illinois falls within the Mississippi Flyway and supports a wide variety of migratory birds. Historically, Illinois birds were found in three basic habitat types: wetland; prairie; and forest. Today, there are four habitat types: wetland; forest; agriculture; and urban/suburban. All four types can be found along the study corridor. A fifth habitat type, rangeland, is restricted to areas of native grassland vegetation. These include native prairie remnants, many of which are located along the study corridor. Native prairie remnants, including their location, are discussed further under Natural Areas, Section 4.6.4.

Wetlands provide a variety of foraging and nesting opportunities for many wading birds (e.g., egrets, herons, bitterns), waterfowl (e.g., ducks, geese, swans), songbirds (e.g., warblers, sparrows, orioles, finches), and shorebirds (e.g., gulls, terns, plover). The thick vegetation provides protection from predators during nesting and the abundance of aquatic plants, insects, clams, snails, frogs and small fish provide an abundance of food. The study corridor crosses many such wetlands, which will be further discussed under Wetlands, Section 4.11.

Forests provide a diversity of food and cover sources for resident (e.g., red-bellied woodpecker, northern cardinal, American robin) and migrating birds (e.g., scarlet

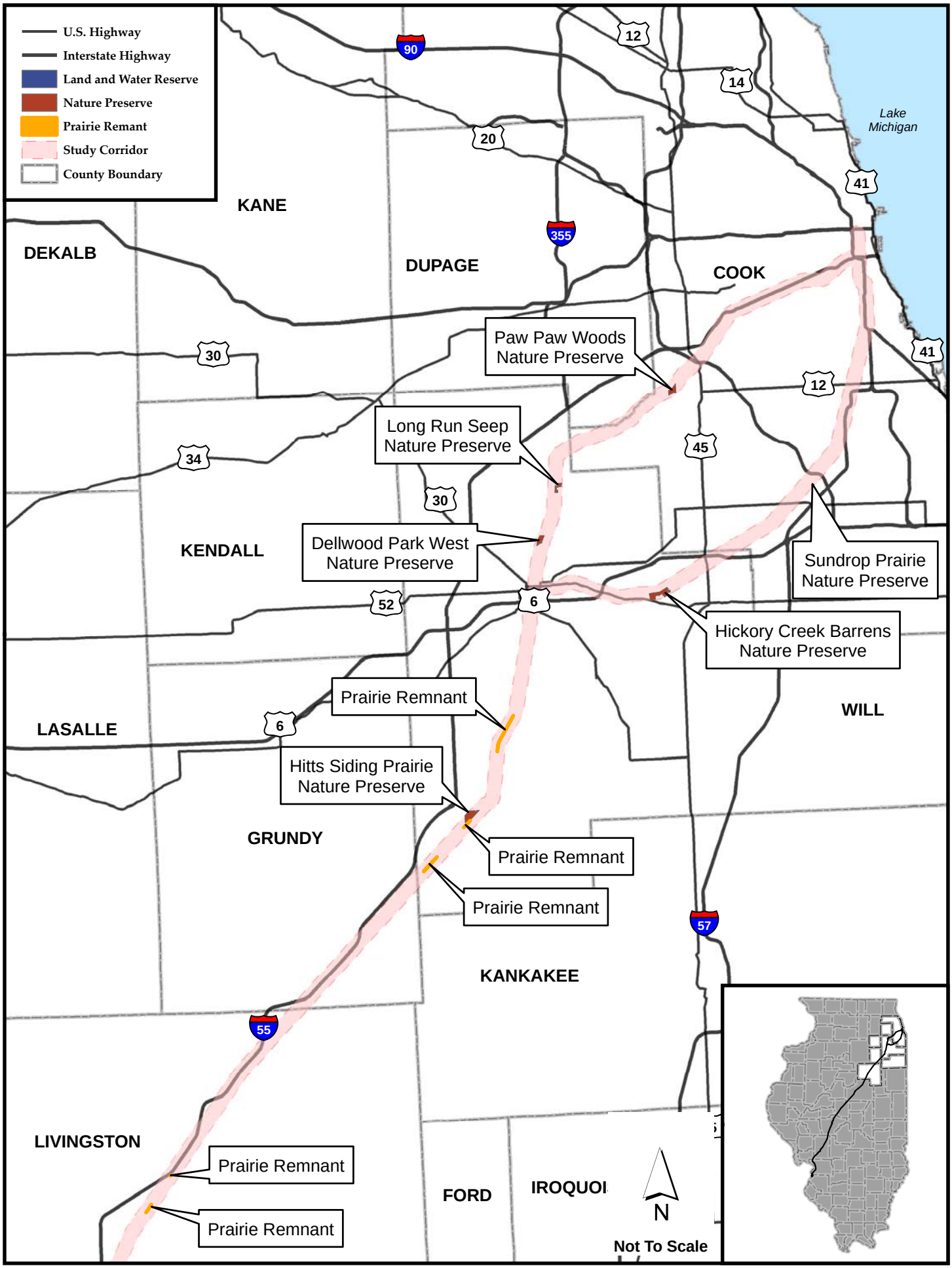


Exhibit 4.6-8. Nature Preserves and Prairie Remnants (1 of 3)

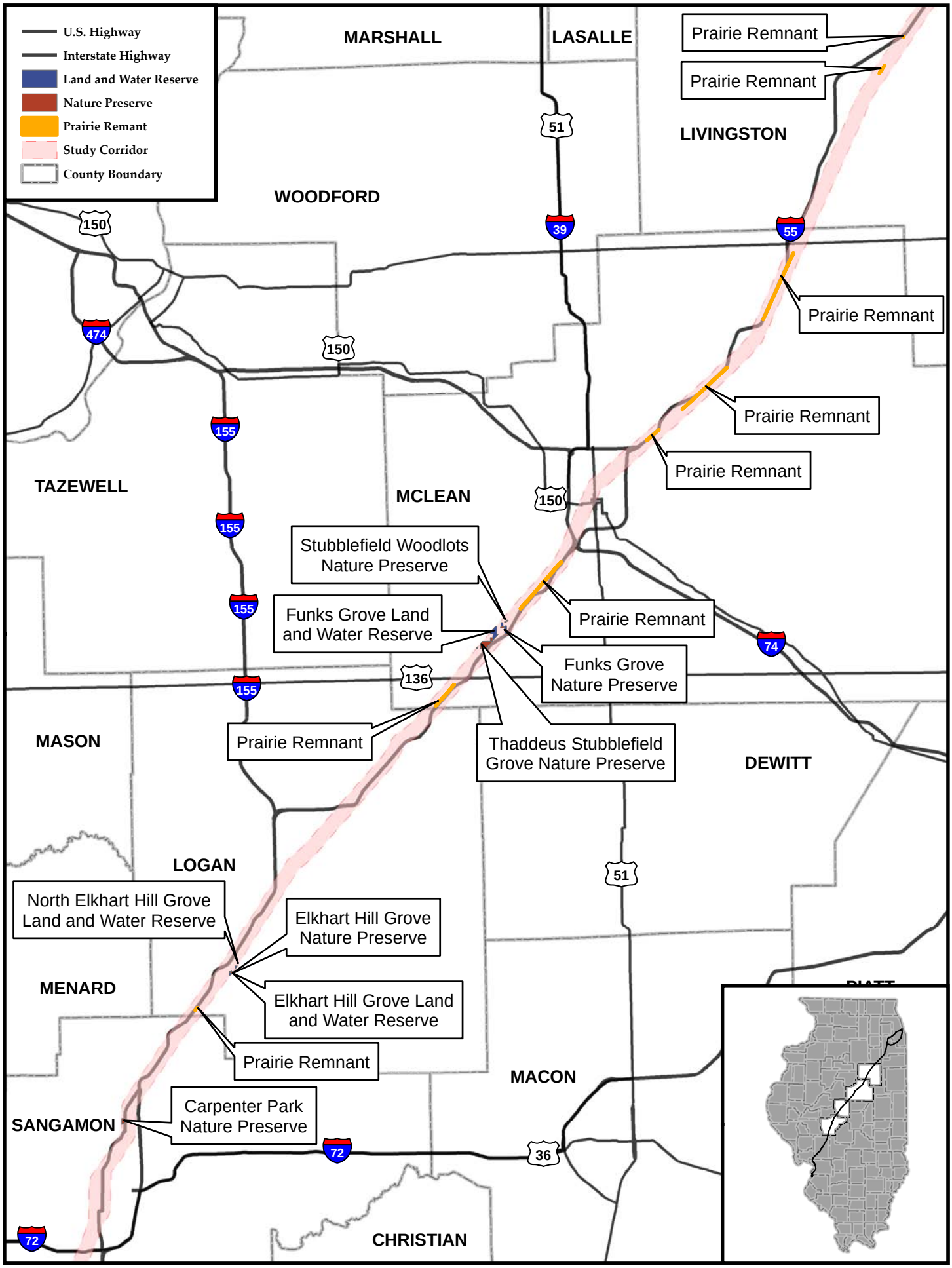


Exhibit 4.6-9. Nature Preserves and Prairie Remnants (2 of 3)

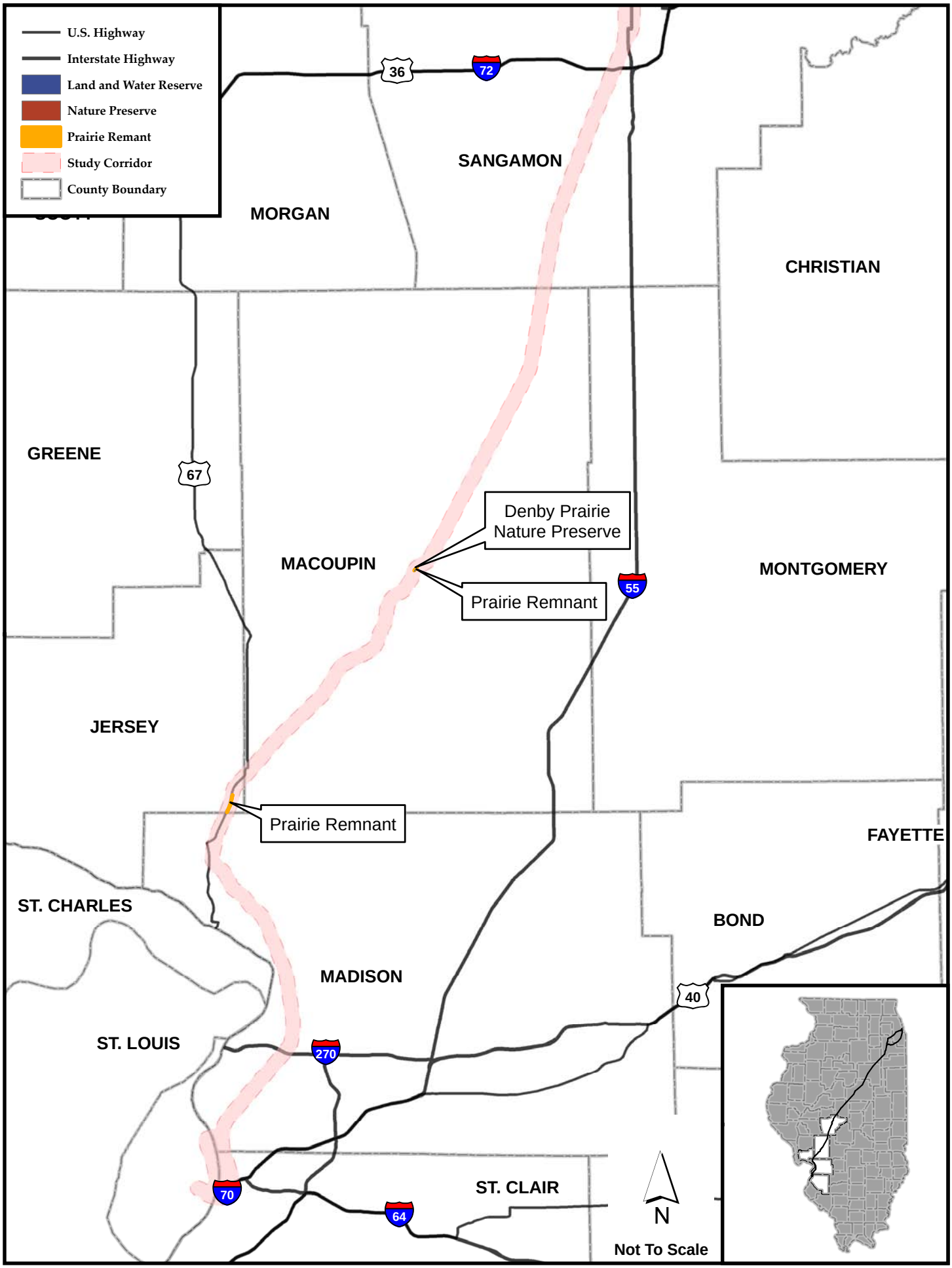


Exhibit 4.6-10. Nature Preserves and Prairie Remnants (3 of 3)

tanager, yellow billed cuckoo, wood thrush). Many bird species will forage on the fruits, berries and nuts provided by forest trees and shrubs. Others may feed on insects found in and on the trees. Many predatory birds (e.g., broad winged hawk, eastern screech owl, American kestrel) rely on the small mammals sheltering in the forest for their primary food source. Birds may nest throughout a forest, from high in the trees to ground leaf litter, as well as the tree cavities in between. There are several forest communities within the study corridor, the majority of which can be found in the riparian of streams in the southwestern extent of the study corridor and in Cook, Dupage, and Will counties in the northern extent of the study corridor.

Prairie had once covered an estimated 22 million acres of Illinois. Since settlement and conversion of prairie to agricultural land, there are now fewer than 2,300 acres of prairie. Populations of grassland-dependent bird species have declined due to the loss of prairie. The majority of the study corridor passes through agricultural land. Along the way are a few isolated prairie remnants where grassland birds (e.g., bobolink, savannah sparrow, henslow's sparrow, eastern meadowlark) find nesting shelter within the tall grasses and forbs. While urbanization can lead to the loss or alteration of natural habitats, some species adapt and move in to the new urban areas. City parks, golf courses, backyard feeders, cemeteries and urban ponds can all provide habitat for urban birds (e.g., morning dove, killdeer, house finch, cedar waxwing, American robin). Birds-of-prey (e.g., peregrine falcon) have moved into and near cities to prey on bird species that otherwise have no predators in the urban environment. There are many urban communities along the study corridor with the highest concentrations located around the St. Louis, Chicago, and Springfield metropolitan areas.

Mammals

The most common Illinois mammals are mice, shrews, rabbits, and squirrels. Larger mammals, such as beavers, badgers, and deer are less abundant. Animals that roamed the vast prairie and forest lands that were once common to Illinois, such as bison, elk, bear, wolves, and mountain lions, have now vanished. Much of the study corridor has been converted to agricultural land, leaving remnant patches of habitat in forest, prairie, meadow, fencerow and wetland, which are isolated and separated by vast areas of agricultural lands. These isolated patches are found throughout the length of the study corridor.

Where these isolated patches of habitat occur, small mammals may be abundant. Forests provide a diversity of food and cover sources for mammals. Skunks, raccoons, foxes, opossums, mice, and chipmunks may be found on the forest floor. Bats, flying squirrels and tree squirrels may be found within the forest canopy, and moles, shrews, and voles may be found below the forest floor.

Prairies, meadows and fencerows within the study corridor can provide cover for rabbits, voles, shrews, ground squirrels, and mice. Feeding on the small mammal inhabitants of these areas are examples of larger carnivorous species such as coyote, red fox, skunk, and weasel. Wetland and marsh species such as beaver and muskrat may

build their homes in the waters of streams, lakes and marshes found within the study corridor. These wetlands provide drinking water for all wild mammal species.

Reptiles and Amphibians

During the past 100 years, urban development, road construction, forest fragmentation, siltation and chemical pollution of streams, containment of major rivers within levees, and drainage of wetlands have further altered and fragmented ranges of amphibians and reptiles (Phillips et al., 1999). Natural habitats have been modified and converted to meet human needs, being fragmented by railroads, highways, deforestation, prairie agriculture, and drainage of great expanses of marsh and floodplain swamps (Phillips et al., 1999). Channelization of other streams has eliminated large areas of floodplain and slough habitats.

Large portions of the southern reach of the study corridor are covered in swampland and dense forests. The region may be home to many reptiles and amphibians including multiple species of salamanders, frogs, turtles, snakes and lizards. Fragmented and small wetland, forest, or prairie habitats that may occur throughout the central and northern portions of the study corridor may also provide suitable habitat for numerous species of amphibians and reptiles. The diversity of reptiles and amphibians that occur in Illinois may be represented within habitats found in the study corridor.

Twenty species of salamanders, representing six families, occur in Illinois. The six families include the hellbender, mudpuppy, lesser siren, eastern newt, mole salamanders, and lungless salamanders, which occur in water or in cool, high-humidity environments in or near the ground where they feed on a variety of other small animals.

Twenty-one species of frogs and toads, including the leopard frog, bullfrog, eastern spadefoot, and eastern narrowmouth, occur in similar habitats in Illinois. These habitats, such as wetlands, ponds, and streams, are present within the study corridor and are suitable for a variety of frogs and toads.

The majority of the eleven species of turtles that occur in Illinois are of the pond and box turtle family, such as the painted, spotted, or eastern box turtle, while the mud turtle family has three species, the yellow mud, eastern mud, and stinkpo. Also occurring in Illinois are the snapping, alligator snapping, smooth soft shell, and spiny softshell turtles. Turtles dwell in forests, prairies, marshes, swamps, ponds, lakes, streams, and rivers. Habitats that are suitable for a variety of turtles are present within the study corridor.

Thirty-four species of non venomous snakes, such as the eastern worm, racer, northern water, and common garter snake occur in Illinois. Additionally, there are four species of venomous viper: the cottonmouth, copperhead, eastern massasauga, and timber rattlesnake. Snakes can be found in every natural habitat in Illinois, and are likely to occur throughout the study corridor.

There are only six native species of lizard in Illinois representing four families: the fence lizard, three skinks (i.e., common five-lined, broad-headed, ground), the six-lined

racerunner, and the legless slender glass lizard. Lizards are most abundant in the southern third of the state in forests, glades, and rocky bluffs. Lizards that occur in forests are likely to occur within the study corridor.

Aquatic Species

There are numerous species of fish, mussels, crustaceans, snails, aquatic insects, and leeches that occur in streams, rivers, ponds, lakes, and wetlands in Illinois. The study corridor traverses multiple drainage basins, all of which support a variety of aquatic life. It is likely that a diversity of organisms will occur within the water resources within the study corridor.

4.6.2.4 Invasive Species

Human activities, such as moving people and things from place to place and cultivating plants and animals, result in the accidental or purposeful introduction of species outside their native range. The subset of nonnative organisms that cause undesirable changes in the invaded ecosystem, spread widely, become overly abundant, or reduce native organisms are termed invasive species (http://www.umesc.usgs.gov/invasive_species.html.) The Upper Midwest Environmental Sciences Center (USGS) lists Asian red carp, Eurasian ruffe, reed canary grass, round goby, sea lamprey, and zebra mussels as invasive species impacting Illinois. These species may be present within the study corridor.

The U.S. Department of Agriculture's Natural Resources Conservation Service lists six plant species as "Invasive and Noxious Weeds." They are: musk thistle, Canada thistle, kudzu, perennial sowthistle, Columbus grass and johnsongrass. Because the study corridor follows the existing right-of-way, which has been previously disturbed, it is likely that these invasive and noxious weeds are present. Construction actions that disturb the soil can spread these invasive species.

4.6.3 Threatened and Endangered Species

The 1973 Endangered Species Act (ESA) provided for the conservation of ecosystems upon which threatened and endangered species of fish, wildlife, and plants depend. Section 7 of the ESA requires federal agencies to insure that any action authorized, funded or carried out by them is not likely to jeopardize the continued existence of listed species or modify their critical habitat.

The Illinois Endangered Species Protection Act of 1972 is similar to the federal ESA but is implemented at the state level. This act gave the Endangered Species Protection Board the responsibility of identifying species as endangered or threatened and the Department of Conservation (now IDNR) the authority to develop a permit system for endangered animals and their products. The Illinois Endangered Species Protection Act "prohibits the possession, taking, transportation, sale, offer for sale, or disposal of any listed animal or products of listed animals without a permit issued by the Department of Conservation (IDNR)."

By referencing the Natural Heritage Data Base, the USFWS webpage, and the Illinois Endangered Species Protection Board, a list was developed that included federal and state threatened and endangered animal and plant species potentially occurring within the counties that the study corridor traverses (Appendix C).

Of all the species listed in Appendix C, the endangered Hine's emerald dragonfly is the only species with USFWS designated Critical Habitat that occurs within the study corridor (Exhibit 4.6-11). Critical Habitat is the specific areas within the geographic area, occupied by the species at the time it was listed, which contain the physical or biological features that are essential to the conservation of endangered and threatened species and that may need special management or protection (USFWS, 2011). Critical Habitat may also include areas that were not occupied by the species at the time of listing but are essential to its conservation (USFWS, 2011). As shown in Exhibit 4.6-11, there are seven separate Critical Habitat Units located in the general vicinity of the existing railroad corridor but only Unit 7 falls completely within the one-mile wide study area and is bisected by the railroad right-of-way. All of the other Units fall mostly outside of the study area.

Segments of the CN and Burlington Northern Santa Fe (BNSF) rail lines between Crest Hill (Will County) and Willow Springs (Cook County) were inventoried for the presence of the federally and state endangered Hine's emerald dragonfly during the summer of 2010 (*Hine's Emerald Dragonfly Monitoring, Chicago to St. Louis High Speed Rail, October 2010*). This segment of the CN rail line represents a portion of Section 1 of Alternatives A and B. The following are excerpts from the monitoring report's Executive Summary regarding the CN rail line.

Along the CN line, the Hine's emerald dragonfly was documented in moderately high abundance (0.59 observations per person-hour) along a 1.1 mile long section south of 135th Street and associated with Long Run Seep Nature Preserve, which is part of Critical Habitat Unit 7, and adjacent privately owned open space. A single Hine's emerald dragonfly observation was also made approximately 3.25 miles to the south, near Dellwood Park. The species was not observed at other locations visited along the CN line, and very little suitable habitat was identified. The Hine's emerald dragonfly is known to occur along less than seven percent of the 18 miles of CN rail line that was monitored.

No larval habitat was observed immediately adjacent to the CN rail line. The nearest known breeding streamlet is at Long Run Seep Nature Preserve, which is approximately 225-feet upgradient from the tracks. Other known streamlets are greater than 0.25-miles from the tracks.

Hine's Emerald dragonflies spent a minimum of 0.05 and a maximum of 109 seconds over the rail right-of-way during the observation periods. At any given sample point within the areas of highest abundance, a Hine's emerald dragonfly was present over the

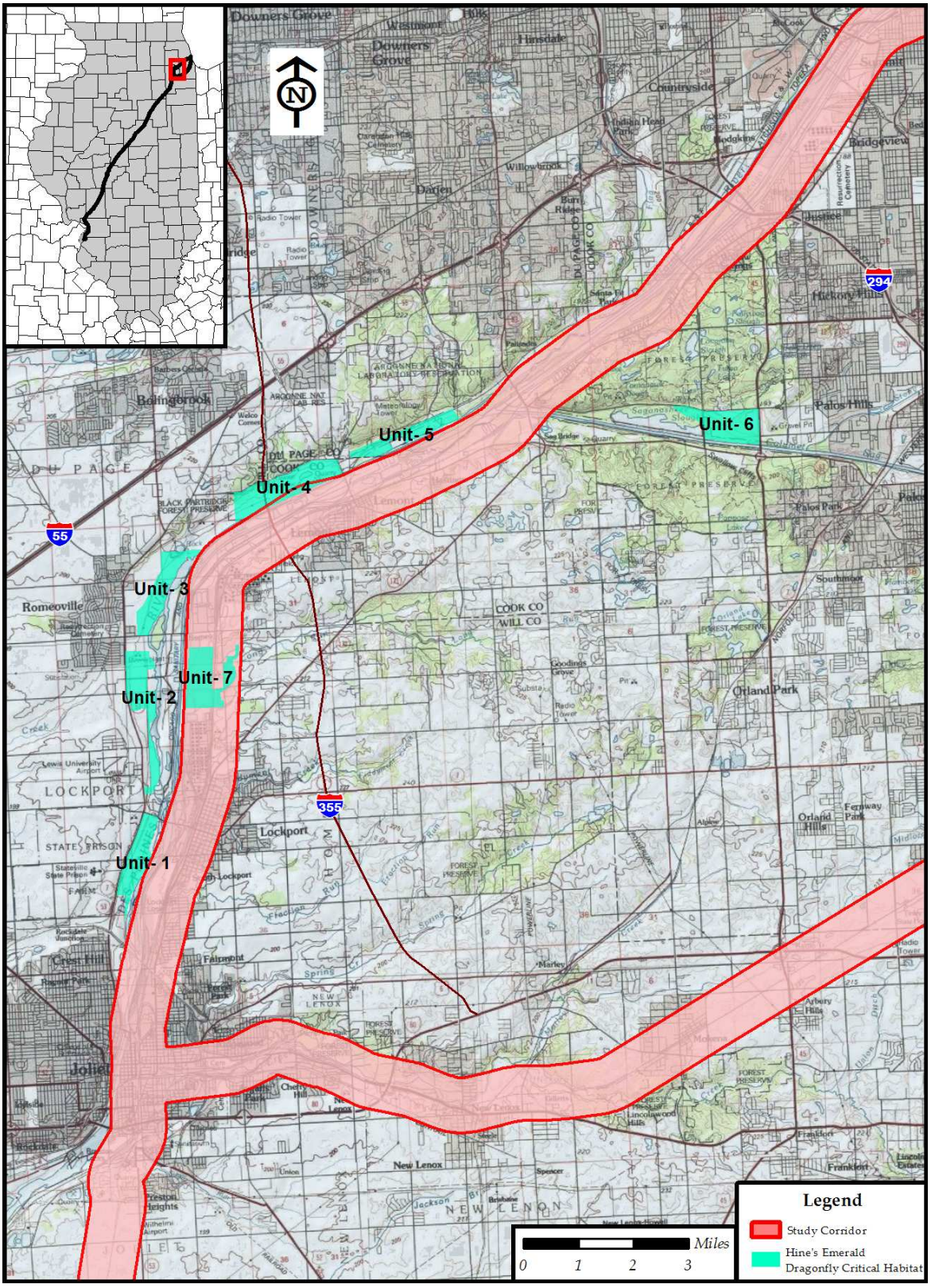


Exhibit 4.6-11 Critical Habitat within the Study Corridor – Hine's Emerald Dragonfly

right-of-way less than one tenth of one percent of the observation time during daylight hours (and during peak summer season in 2010).

At known sites, Hine's emerald dragonfly observations were fairly evenly distributed over the hours between 8:00 am and 1:00 pm. Afternoon and evening abundance could be high at certain hours on certain days, yet there was an absence of sightings at other times and/or on other days. In general afternoon and evening presence was unpredictable and characterized by brief spikes of activity. No dragonfly-train interactions were observed on the CN line.

In conclusion, within the study area the Hine's emerald dragonfly is known to be present over a relatively small percentage of the CN rail corridor. Within the June through August 2010 adult flight season, and within the known Illinois activity areas, the chance of a Hine's emerald dragonfly being present in any one moment of time at any one sample point was very small. Because 2010 Hine's emerald dragonfly adult abundance was toward the low end of what has been reported in Illinois over 16 years of monitoring, the probability of dragonfly presence within the rail corridor could be higher in some years than those observed in 2010.

4.6.4 Natural Areas

Permanently protected by state law, nature preserves are private and public lands that have rare plants, animals, or other unique natural features (http://www.dnr.state.il.us/inpc/). The Illinois Natural Areas Preservation Act of 1963 preserves, protects and defends natural areas and endangered species habitat for public benefit. The act stipulates that nature preserves be maintained in the natural condition and be used in a manner consistent with their continued preservation. The Illinois Nature Preserves Commission (INPC) maintains a list of the protected areas of Illinois. The Illinois Nature Areas Inventory (INAI) – completed in 1978 and undergoing a thorough update – designates the state's most rare nature areas. It serves as a guide for the INPC when determining the eligibility of lands for protection (http://www.dnr.state.il.us/inpc/). The Illinois Endangered Species Protection Act requires consultation for INAI sites due to their ecological sensitivity.

Fifteen protected areas and 13 prairie remnants are located within study corridor. A total of 1,600 acres of Nature Preserve, Land and Water Reserve, or Natural Heritage Landmark are found within the study corridor. Protected areas located within the study corridor are identified in Table 4.6-1 and the previous Exhibits 4.6-8 through 4.6-10.

Table 4.6-1. INPC Protected Areas within Study Corridor

INPC Protected Areas Within Study Corridor	Area (Acres within Corridor)	INPC #
Paw Paw Woods Nature Preserve	127	NP007
Funks Grove Nature Preserve	15	NP136
Denby Prairie Nature Preserve	3	NP147
Thaddeus Stubblefield Grove Nature Preserve	211	NP232
Hitts Siding Prairie Nature Preserve	280	NP280
Hickory Creek Barrens Nature Preserve	319	NP271
Stubblefield Woodlots Nature Preserve	12	NP156
Carpenter Park Nature Preserve	41	NP069
Elkhart Hill Grove Nature Preserve	15	NP308
Elkhart Hill Grove Land and Water Reserve	17	LWR069
Long Run Seep Nature Preserve	89	NP188
Sundrop Prairie Nature Preserve	113	NP292
North Elkhart Hill Grove Land and Water Reserve	12	LWR123
Dellwood Park West Nature Preserve	121	NP336
Funks Grove Land and Water Reserve	225	LWR145

4.7 Air Quality

Air quality describes the level of pollution in the air. Individual air pollutants degrade the atmosphere by reducing visibility, damaging property, reducing the productivity or vigor of crops or natural vegetation, or harming human or animal health.

As required by the Clean Air Act (CAA) and the 1990 Clean Air Act Amendments (CAAA), the U.S. Environmental Protection Agency (USEPA) has established National Ambient Air Quality Standards (NAAQS) for six major air pollutants. These pollutants, known as criteria pollutants, are carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), particulate matter (PM_{10}, $PM_{2.5}$), ozone (O_3), and sulfur dioxide (SO_2). These

pollutants are shown in Table 4.7-1. The "primary" standards have been established to protect the public health. The "secondary" standards, intended to protect the nation's welfare, account for air pollutant effects on soil, water, visibility, materials, vegetation, and other aspects of the general welfare.

In addition to the criteria pollutants, USEPA also regulates air toxics. Mobile source air toxics (MSATs) are compounds emitted from highway vehicles and non-road equipment that are known or suspected to cause cancer or other serious health and environmental effects. Most air toxics originate from human made sources, including on-road mobile sources, non-road mobile sources (e.g., trains), area sources (e.g., dry cleaners), and stationary sources (e.g., factories or refineries).

Also of concern are greenhouse gases (GHG) that trap heat in the atmosphere. These gases are necessary to life as we know it, since they keep the planet's surface warmer than it otherwise would be. As concentrations of greenhouse gases increase, however, the Earth's temperature rises. This is known as the "Greenhouse Gas Effect." Effects of these rising temperatures include climate change and rising sea levels. With respect to transportation-related and other fossil fuel combustion sources, the GHG of primary concern is CO_2. Other GHGs of concern include methane (CH_4), nitrous oxide (N_2O) and certain fluorinated gases ("F-gases").

The criteria pollutants of concern are PM_{10} and $PM_{2.5}$ due to the diesel locomotive emissions, CO due to emissions from roadway vehicles, and ozone. Ozone is formed through photochemical reactions between precursor gases – volatile organic compounds [VOCs] and nitrogen oxides [NO_x] – whose sources include the exhaust of internal combustion engines such as those associated with roadway vehicles and diesel electric locomotives. The potential impacts on air toxics and GHGs, due to emissions from roadway vehicles, diesel trains, and related facilities, also are considered.

4.7.1 Existing Conditions

EPA publishes a list of all geographic areas in compliance with the NAAQS, as well as those areas not in attainment of the NAAQS. The designation of an area is made on a pollutant-by-pollutant basis. Areas classified as "attainment areas" comply with the applicable NAAQS. Areas once classified as nonattainment that have since demonstrated attainment of the NAAQS are classified as "maintenance areas." Areas not in compliance with the NAAQS are classified as "nonattainment areas."

Table 4.7-1. National Ambient Air Quality Standards

Pollutant	Primary Standards			Form
	Averaging Time	Level	Status	
Carbon Monoxide (CO)	8-hour	9 ppm	Current; most recently affirmed August 2011.	Not to be exceeded more than once per year.
	1-hour	35 ppm		
Lead (Pb)	Rolling 3-Month Average	0.15 μg/m^3	Current. Designations completed November 2011. SIPs addressing nonattainment areas due to EPA 2012-2013.	Not to be exceeded.
Nitrogen Dioxide (NO_2)	1-hour (primary)	100 ppb	Current.	98th percentile, averaged over 3 years.
	Annual	53 ppb	Current.	Mean.
Particulate Matter (PM_{10})	24-hour	150 μg/m^3	Current.	Not to be exceeded more than once per year on average over 3 years.
Particulate Matter ($PM_{2.5}$)	Annual	15 μg/m^3	Current.	Annual mean, averaged over 3 years.
	24-hour	35 μg/m^3	Effective 2006. SIPs addressing nonattainment areas due to EPA at end of 2012.	98th percentile, averaged over 3 years.
		65 μg/m^3	Effective 1997. Related implementation rules remain in place.	98th percentile, averaged over 3 years.
Ozone	8-hour	0.075 ppm	Effective 2008. Area designations issued April 2012. SIPs addressing nonattainment areas due to EPA by 2015.	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years.
	8-hour	0.08 ppm	Effective 1997. Related implementation rules remain in place.	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years.
Sulfur Dioxide (SO_2)	1-hour (primary)	75 ppb	Current. Attainment plans due January 2014.	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years.
	3-hour (secondary)	0.5 ppm	Current.	Not to be exceeded more than once per year.

The attainment status of each area affected by the proposed program is provided in Table 4.7-2. As shown, all counties affected by the program are classified as attainment areas for CO and PM_{10}. Several of the counties, however, are classified as nonattainment for ozone and/or $PM_{2.5}$.

Table 4.7-2. Attainment Status[1]

County/State	Pollutant and Attainment Status				
	CO	Ozone	PM_{10}	$PM_{2.5}$	Pb
Cook / IL	Attainment	Nonattainment	Attainment	Nonattainment	Attainment
Grundy (Aux Sable and Goose Lake Townships) / IL	Attainment	Nonattainment	Attainment	Nonattainment	Attainment
Grundy (remainder) / IL	Attainment	Attainment	Attainment	Attainment	Attainment
Jersey / IL	Attainment	Nonattainment	Attainment	Attainment	Attainment
Livingston / IL	Attainment	Attainment	Attainment	Attainment	Attainment
Logan / IL	Attainment	Attainment	Attainment	Attainment	Attainment
Macoupin / IL	Attainment	Attainment	Attainment	Attainment	Attainment
Madison (Granite City) / IL	Attainment	Nonattainment	Attainment	Nonattainment	Nonattainment
Madison (remainder) / IL	Attainment	Nonattainment	Attainment	Nonattainment	Attainment
McLean / IL	Attainment	Attainment	Attainment	Attainment	Attainment
Sangamon / IL	Attainment	Attainment	Attainment	Attainment	Attainment
St. Clair / IL	Attainment	Nonattainment	Attainment	Nonattainment	Attainment
Will / IL	Attainment	Nonattainment	Attainment	Nonattainment	Attainment
St. Louis / MO	Attainment	Nonattainment	Attainment	Nonattainment	Attainment

Source: EPA, 2012

[1] As of February 2012

The CAAA requires federal agencies to ensure that their actions conform to the appropriate State Implementation Plan (SIP). The SIP provides for implementation, maintenance, and enforcement of the NAAQS. General conformity procedures were established under Section 176(c)(4) of the CAA to provide states a tool to help them

improve air quality in areas that do not meet the NAAQS. Under the General Conformity Rule, federal actions that occur in a nonattainment or maintenance area must conform to the air quality plans established in the applicable SIP. The Conformity Rule ensures:

- Federal activities do not cause or contribute to new violation of NAAQS;
- Actions do not cause additional or worsen existing violations of or contribute to new violations of the NAAQS; and
- Attainment of the NAAQSs is not delayed.

As a program being developed under FRA, it falls under the General Conformity Rule, which requires a conformity determination for each pollutant where the total of direct and indirect emissions in a nonattainment or maintenance area caused by a federal action would equal or exceed EPA-specified significant threshold values. In Illinois, general conformity criteria and procedures are set forth in 35 Illinois Administrative Code 255. The air quality analysis in this document has been prepared in accordance with these state regulations.

4.7.2 Ambient Air Quality

Air quality monitors are located in virtually all counties along the study corridor. Table 4.7-3 shows data for criteria pollutants of greatest concern within the study corridor– those for which one or more counties through which the corridor passes are either nonattainment or recommended by the applicable state to be designated as nonattainment. Such pollutants include ozone, Pb, SO_2, and $PM_{2.5}$. For each of these pollutants, Table 4.7-3 provides statistical pollutant concentration values relevant to assessing NAAQS compliance. These values are provided for each county where the indicated pollutant is of concern. For each of these pollutants, Table 4.7-3 then indicates whether or not the applicable NAAQS was exceeded.

Data are provided for the most recent three years for which comprehensive and official monitoring data are available. For each pollutant, at least one violation was documented within at least one of the counties of concern during at least one of the three years considered. However, for ozone, this assertion applies only to the 2008 standard, which is currently being implemented; it does not apply to the 1997 standard that is the basis for current attainment planning efforts. Furthermore, while the documented SO_2 violation is currently part of a data set that supports Illinois' recommendation that four counties (including Cook and Madison) be designated as nonattainment, no such designation has yet occurred. Also, note that determination of attainment status for some pollutants is based on a multiyear evaluation, whereas any violations indicated in Table 4.7-3 are based only on a single year of data.

Table 4.7-3. Criteria Air Pollutant Monitoring Data

Pollutant	Averaging Period	Parameter	County/State	Value		
				2008	2009	2010
Ozone	8-hour	Max. Concentration (ppm) for 4th-Highest Day	Cook / IL	0.071	0.076	0.077
			Grundy (Aux Sable and Goose Lake Townships) / IL	N/A	N/A	N/A
			Jersey / IL	0.069	0.068	0.072
			Madison / IL	0.07	0.074	0.08
			St. Clair / IL	0.064	0.069	0.072
			Will / IL	0.06	0.063	0.065
			St. Louis / MO	0.069	0.07	0.076
		> 1997 NAAQS (0.08 ppm, effectively 0.084 ppm)	Cook / IL	No	No	No
			Grundy (Aux Sable and Goose Lake Townships) / IL	N/A	N/A	N/A
			Jersey / IL	No	No	No
			Madison / IL	No	No	No
			St. Clair / IL	No	No	No
			Will / IL	No	No	No
			St. Louis / MO	No	No	No
		> 2008 NAAQS (0.075 ppm)	Cook / IL	No	Yes	Yes
			Grundy (Aux Sable and Goose Lake Townships) / IL	N/A	N/A	N/A
			Jersey / IL	No	No	No
			Madison / IL	No	No	No
			St. Clair / IL	No	No	No
			Will / IL	No	No	No
			St. Louis / MO	No	No	Yes
SO_2	1-hour	99th Percentile Concentration (ppb)	Cook / IL	N/A	N/A	90
			Madison / IL	N/A	N/A	57
		> NAAQS (75 ppb)	Cook / IL	N/A	N/A	Yes
			Madison / IL	N/A	N/A	No
Pb	Rolling 3-Month Average	Maximum Concentration	Madison (Granite City) / IL	I/D	0.12	0.42
		> NAAQS (0.15 $\mu g/m^3$)	Madison (Granite City) / IL	I/D	No	Yes

Table 4.7-3. Criteria Air Pollutant Monitoring Data (continued)

Pollutant	Averaging Period	Parameter	County/State	Value		
				2008	2009	2010
$PM_{2.5}$	24-hour	98th Percentile Concentration (μg/m³)	Cook / IL	34	33	35
			Grundy (Aux Sable and Goose Lake Townships) / IL	N/A	N/A	N/A
			Jersey / IL	22	19	21
			Madison / IL	36	25	29
			St. Clair / IL	I/D	24	24
			Will / IL	31	26	28
			St. Louis / MO	26	I/D	27
		> 2006 NAAQS (35 μg/m³)	Cook / IL	No	No	No
			Grundy (Aux Sable and Goose Lake Townships) / IL	N/A	N/A	N/A
			Jersey / IL	No	No	No
			Madison / IL	Yes	No	No
			St. Clair / IL	I/D	No	No
			Will / IL	No	No	No
			St. Louis / MO	No	I/D	No
	Annual Mean	Concentration (μg/m³)	Cook / IL	12.5	12.9	14
			Grundy (Aux Sable and Goose Lake Townships) / IL	N/A	N/A	N/A
			Jersey / IL	10.1	9.9	11.2
			Madison / IL	15.7	11.4	14.6
			St. Clair / IL	I/D	11.7	13
			Will / IL	11.7	10.5	11.8
			St. Louis / MO	12	I/D	11.2
		> NAAQS (15 μg/m³)	Cook / IL	No	No	No
			Grundy (Aux Sable and Goose Lake Townships) / IL	N/A	N/A	N/A
			Jersey / IL	No	No	No
			Madison / IL	Yes	No	No
			St. Clair / IL	I/D	No	No
			Will / IL	No	No	No
			St. Louis / MO	No	I/D	No

Source: EPA, 2012 (N/A = Not available; I/D = Insufficient data)

4.8.1 Noise Descriptors

Noise is usually defined as sound that is undesirable because it interferes with speech communication and hearing, or is otherwise annoying. Under certain conditions, noise may cause hearing loss, interfere with human activities, and in various ways may affect people's health and well-being.

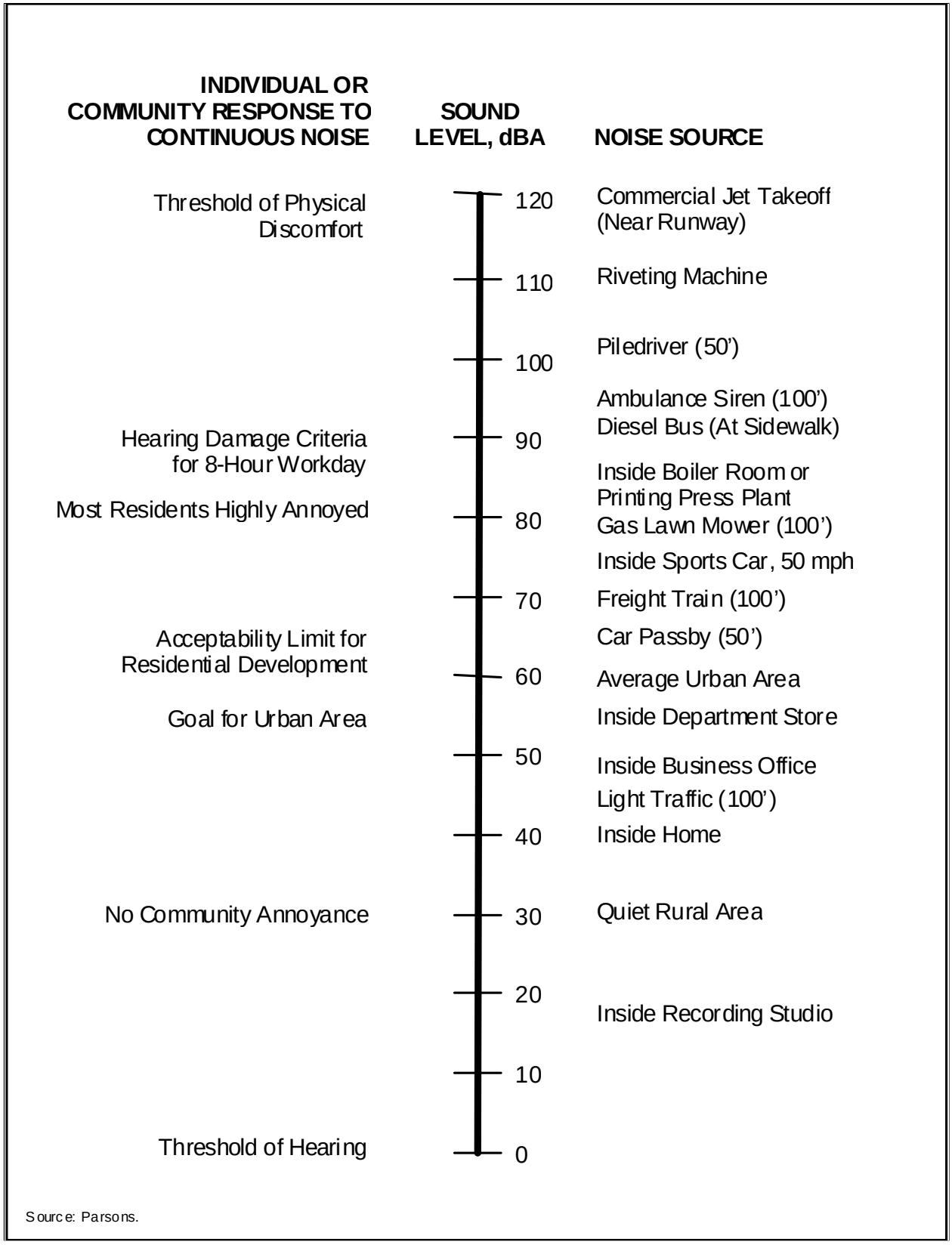
The decibel (dB) is the accepted standard unit for measuring the amplitude of sound because it accounts for the large variations in sound pressure amplitude. When describing sound and its effect on a human population, A-weighted (dBA) sound pressure levels are typically used to account for the response of the human ear to different frequencies. The term "A-weighted" refers to a filtering of the noise signal in a manner corresponding to the way the human ear perceives sound. The A-weighted noise level has been found to correlate well with people's judgments of the noisiness of different sounds and has been used for many years as a measure of community noise. Exhibit 4.8-1 illustrates typical A-weighted sound pressure levels for various noise sources.

Community noise levels usually change continuously during the day. The equivalent continuous A-weighted sound pressure level (L_{eq}) is normally used to describe community noise. The L_{eq} is the equivalent steady-state A-weighted sound pressure level that would contain the same acoustical energy as the time-varying A-weighted sound pressure level during the same time interval. The maximum sound pressure level (L_{max}) is the greatest instantaneous sound pressure level observed during a single noise measurement interval.

Another descriptor, the day-night average sound pressure level (L_{dn}), was developed to evaluate the total daily community noise environment. The L_{dn} is a 24-hour average sound pressure level with a 10-dB time-of-day weighting added to sound pressure levels that occur during the nine nighttime hours from 10:00 p.m. to 7:00 a.m. This nighttime 10-dB adjustment is an effort to account for the increased sensitivity to nighttime noise events. The Federal Railroad Administration (FRA) uses L_{dn} and L_{eq} to evaluate train noise impacts at the surrounding communities (USDOT, 2005).

4.8.2 Vibration Descriptors

Vibration is an oscillatory motion, which can be described in terms of displacement, velocity, or acceleration. Displacement, in the case of a vibrating floor, is simply the distance that a point on the floor moves away from its static position. The velocity represents the instantaneous speed of the floor movement, and acceleration is the rate of change of the speed. The response of humans, buildings, and equipment to vibration is normally described using velocity or acceleration. Velocity will be used in describing ground-borne vibration.



Source: Parsons.

Exhibit 4.8-1. Typical A-Weighted Sound Levels

Vibration amplitudes are usually expressed as either peak particle velocity (PPV) or the root mean square (RMS) velocity. PPV is used to evaluate the potential for building damage. It is defined as the maximum instantaneous peak of the vibration signal. PPV is not considered the appropriate measurement for evaluating the human response to vibration. RMS is used to evaluate human response, since it takes some time for the human body to respond to vibration signals. The RMS of a signal is the square root of the average of the squared amplitude of the signal. For sources such as trucks or motor vehicles, PPV levels are typically 6 to 14 dB higher than RMS levels. FRA uses the abbreviation, "VdB", for vibration decibels for both RMS and PPV to reduce the potential for confusion with sound decibel (USDOT, 2005).

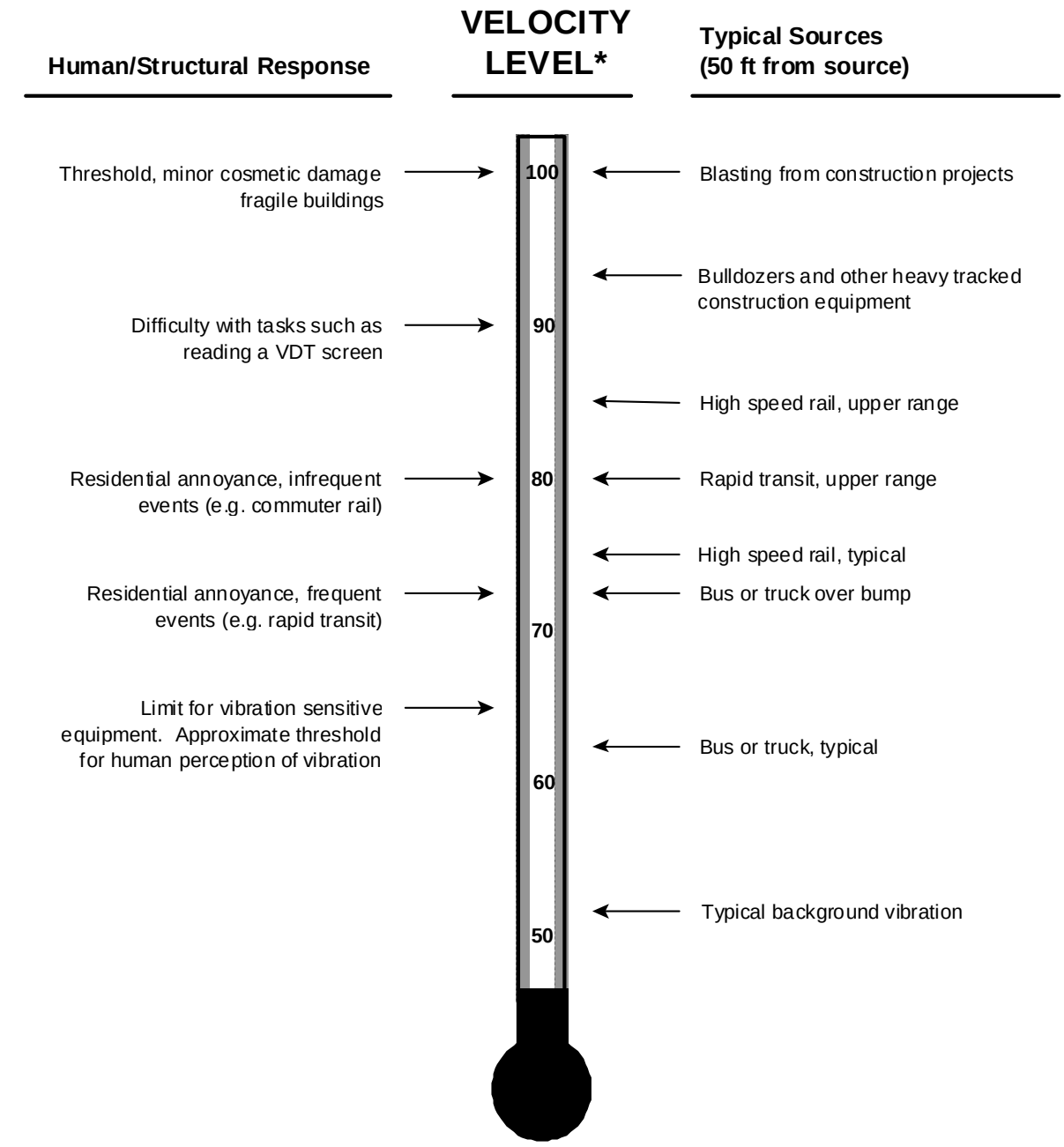
Decibel notation acts to compress the range of numbers required in measuring vibration. Similar to the noise descriptors, L_{eq} and L_{max} can be used to describe the equivalent vibration and the maximum vibration level observed during a single vibration measurement interval.

Exhibit 4.8-2 illustrates common vibration sources and the human and structural responses to ground-borne vibration. As shown in Exhibit 4.8-2, the threshold of perception for human response is approximately 65 dB; however, human response to vibration is not usually significant unless the vibration exceeds 70 dB.

4.8.3 Existing Setting

4.8.3.1 Existing Noise Levels

Existing noise levels were calculated through the study corridor using methodologies for estimating noise levels from trains from the FRA *High Speed Ground Transportation Noise and Vibration Impact Assessment* manual (USDOT, 2005), the *Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment* manual (USDOT, 2006) and the FRA *Chicago Region Environmental and Transportation Efficiency (CREATE) Noise Model* (USDOT, 2006). These noise levels are listed in Table 4.8-1 by section. (The sections are defined in Chapter 3.) The existing noise levels include the noise contributions from existing intercity passenger, commuter, and freight trains since trains are the predominant noise source for sensitive receivers adjacent to the tracks. The worst-case noise levels are listed. Noise levels vary throughout the Chicago to St. Louis Corridor because the number of existing trains operating within the corridor vary.



** RMS Vibration Velocity Level in dB relative to 10^{-6} inches/second*

Source: *High Speed Ground Transportation Noise and Vibration Impact Assessment,* U.S. DOT Federal Railroad Administration, 1998.

Exhibit 4.8-2. Typical Levels of Ground-Borne Vibration

Table 4.8-1 Existing Noise Levels

Section	Noise Level, Ldn (dBA)			
	50 feet[1]	100 feet[1]	200 feet[1]	300 feet[1]
1	71	66	59	56
2	73	68	61	58
3	74	69	61	59
4	74	69	61	59
5	77	73	65	63
6	74	69	61	59
7	74	69	61	59

[1] Distance from track centerline

4.8.3.2 Existing Vibration Levels

Existing vibration levels were estimated based on the generalized ground borne vibration curves included in the FRA and FTA noise and vibration manuals for freight and passenger rail trains. These curves provide vibration levels at different distances from the track. Vibration is analyzed based on a single train passby per FRA guidelines. Since the focus is on a single train passby, it is not necessary to list vibration levels by section. The existing vibration levels are listed in Table 4.8-2.

Table 4.8-2 Existing Vibration Levels

Vibration Source	Vibration Level, VdB			
	50 feet[1]	100 feet[1]	200 feet[1]	300 feet[1]
Passenger Train (79 mph)[2]	77	71	64	59
Freight Train (50 mph)	84	78	72	67

[1] Distance from track centerline

[2]Current maximum operating speed for passenger trains.

4.9 Water Quality/Resources

The study corridor used for water quality/resources is one mile wide (half a mile on either side of the section alignments).

4.9.1 Surface Water

There are a total of 216 surface water (i.e., streams and ponds) crossings along the existing rail corridor. The majority of the crossings involve culverts (i.e., 154) over small

streams while the remaining crossings involve bridges (i.e., 62) over larger streams, rivers, and open water.

4.9.2 Drainage Basins

There are ten major drainage basins found within the study corridor (Table 4.9-1) (IEPA, 2010). All of the drainage basins within the study corridor flow to the Mississippi River. These basins are shown on Exhibits 4.9-1 through 4.9-3.

Table 4.9-1. Drainage Basins*

Major River Basin	Drainage Area (sq. mi.)	Sub-Basins
Mississippi South Central River	2,316	Peruque-Piasa; Cahokia-Joachim
Lower Illinois/Macoupin Creek	3,250	Lower Illinois; Macoupin
Lower Sangamon River	2,063	South Fork Sangamon; Lower Sangamon
Salt Creek of Sangamon River	1,868	Salt
Mackinaw River	1,149	Mackinaw
Vermilion (Illinois) River	1,333	Vermilion
Upper Illinois/Mazon River	4,069	Upper Illinois; Lower Fox; Lower Illinois-Senachwine Lake
Kankakee/Iroquois River	5,167	Kankakee; Iroquois
Des Plaines River	1,455	Des Plaines
Great Lakes/Calumet River	1,764	Little Calumet-Galien; Pike-Root, Chicago

*IEPA, 2010, Appendix B-1, Illinois EPA Basins

Due to the high demand from agricultural needs, stream channelization is common throughout the state of Illinois. This is evident for streams in the Des Plaines, Kankakee and Sangamon basins and the Vermilion and Mackinaw sub-basins of the Illinois Basin (IDNR, 1994). Surrounding land uses directly influence physical, chemical and biological aspects of streams and rivers.

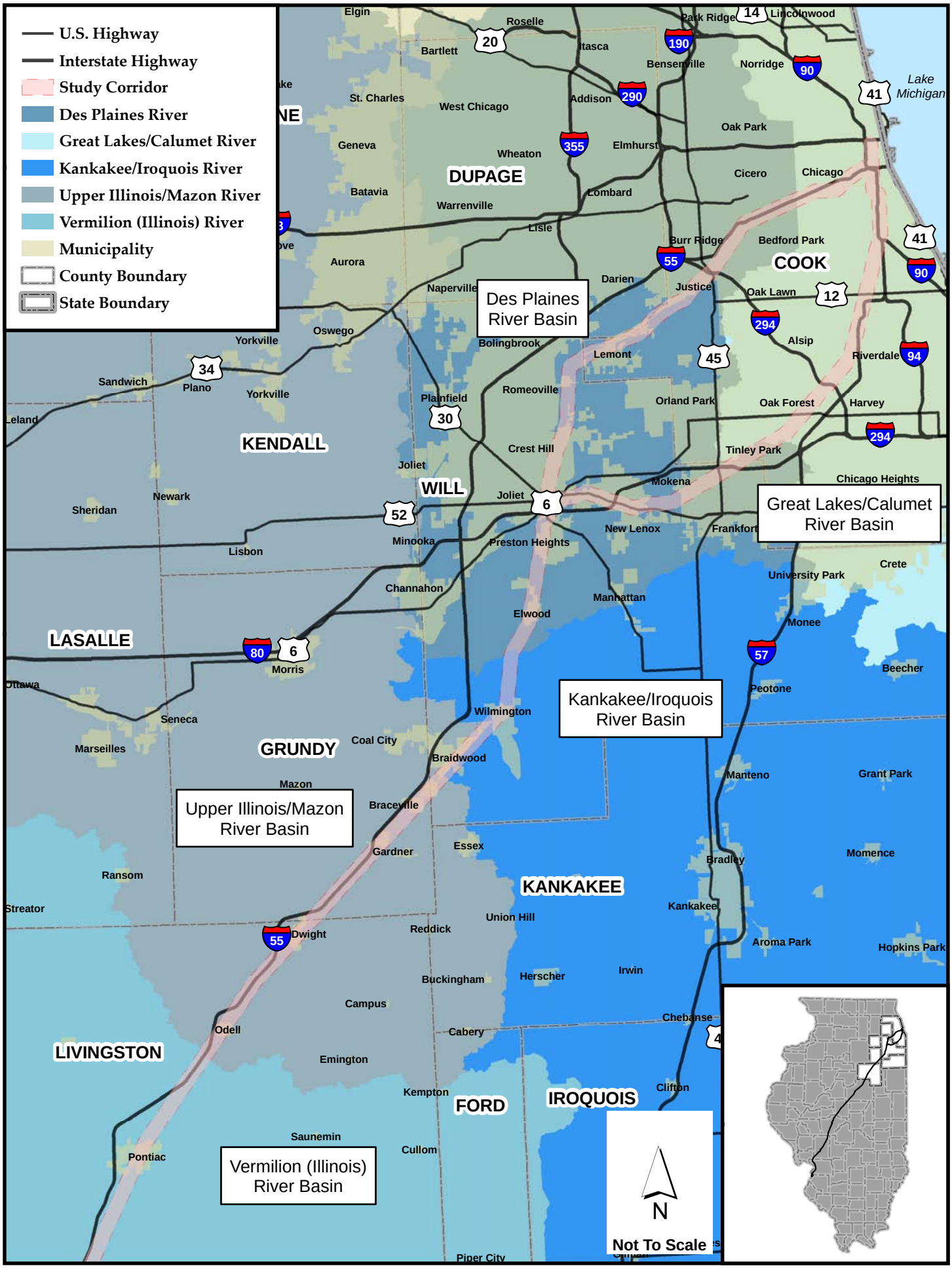


Exhibit 4.9-1. Drainage Basins (1 of 3)

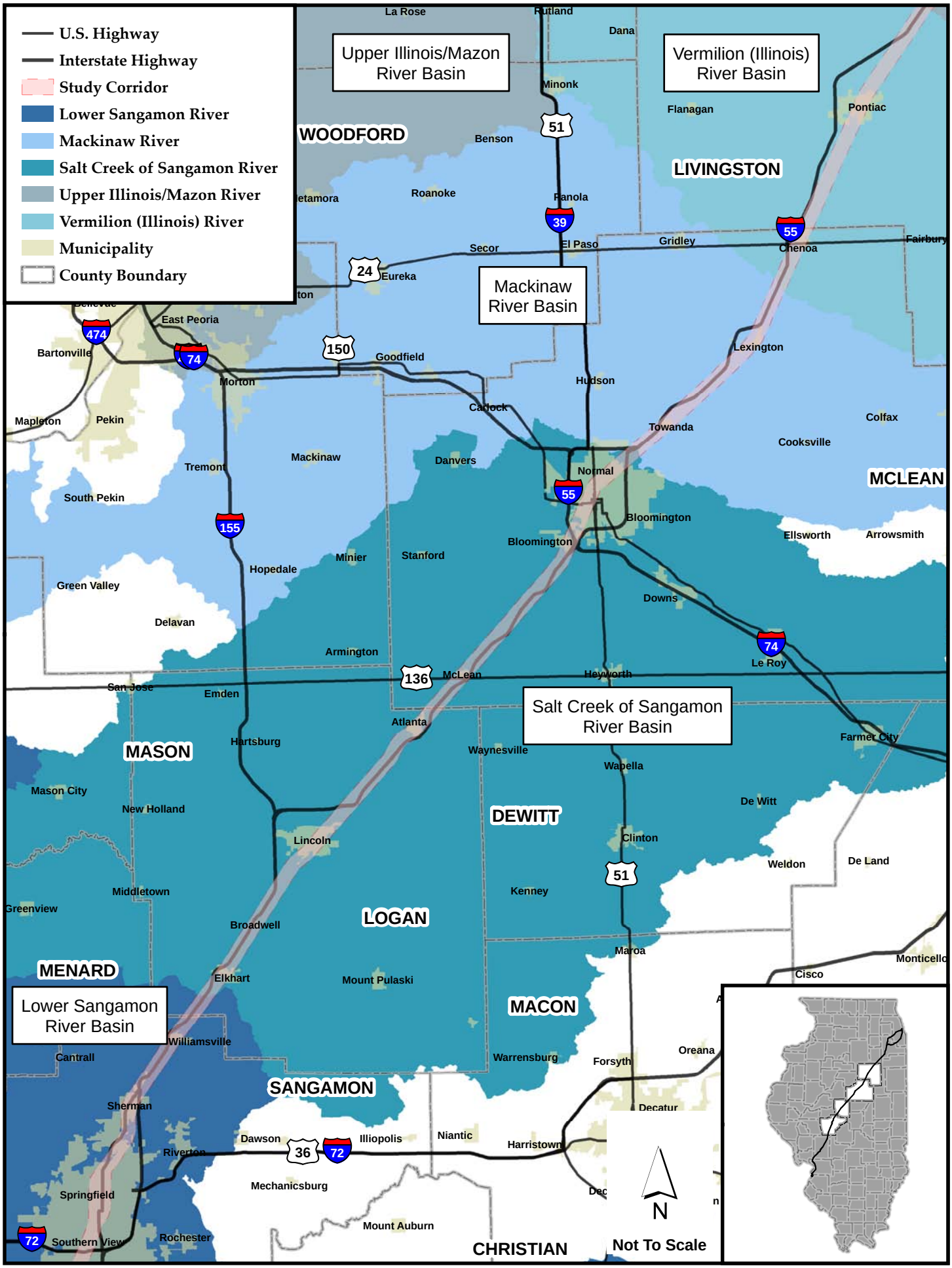


Exhibit 4.9-2. Drainage Basins (2 of 3)

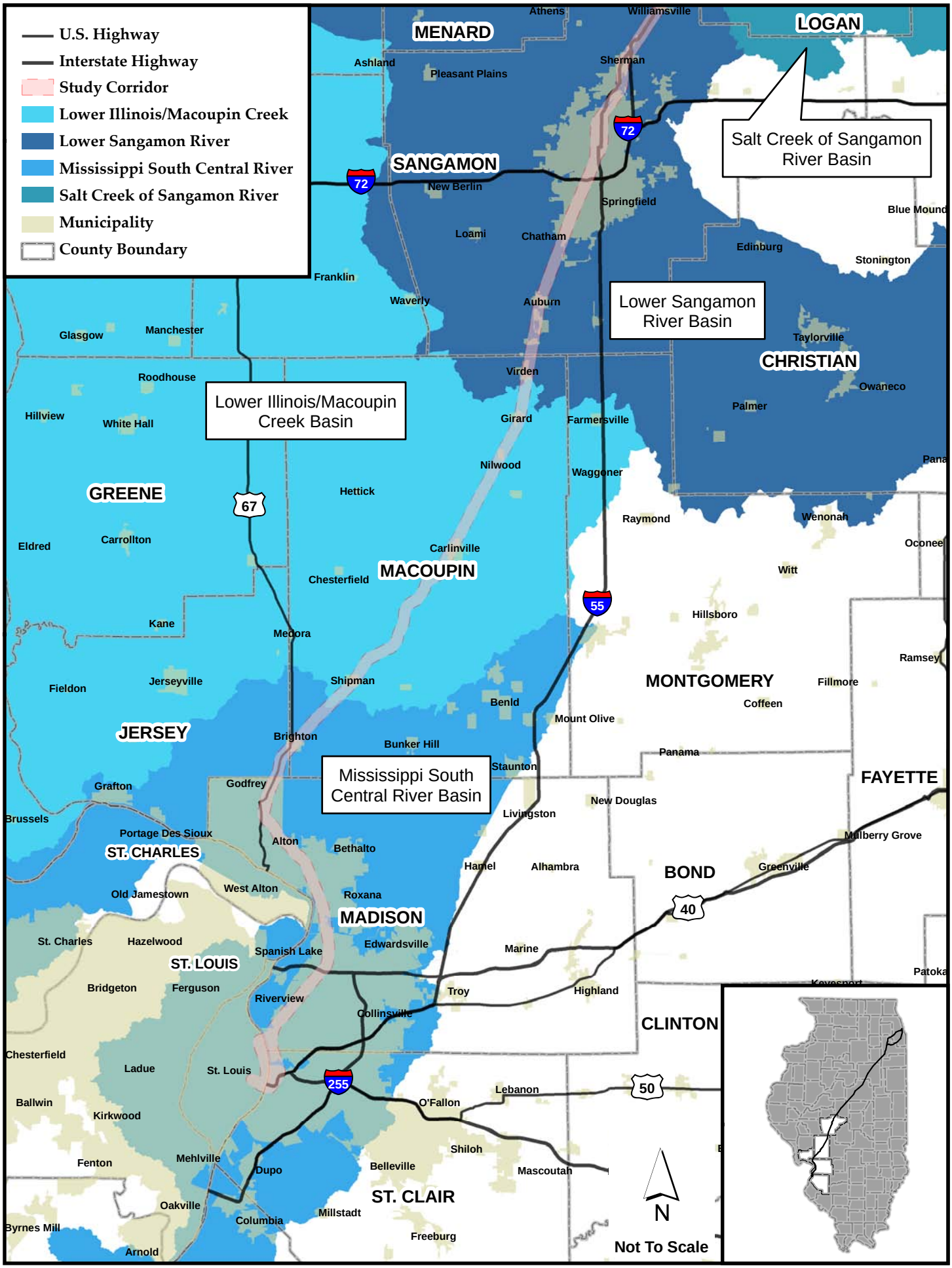


Exhibit 4.9-3. Drainage Basins (3 of 3)

The many ponds, lakes, streams and rivers that surround the study corridor support a wide array of aquatic life forms. Survival, growth, and reproductive success of aquatic species often require a narrow set of habitat requirements. Aquatic habitat conditions include physical and water quality variables (Wilcox, 1993). A number of specialized communities exist on the water surface, in the water column, on or in cover structures, and on or in the substrate (Wilcox, 1993). Habitat conditions in running water can be defined using descriptors of water temperature, dissolved gases, dissolved solids, suspended solids, current velocity, turbulence, depth, substrate type, light, and cover (Hynes, 1970; Gorman and Karr, 1978; Statzner et al., 1988; Wilcox, 1993). The character of the channel bed may be the primary physical factor influencing the distribution and abundance of aquatic invertebrates (Ivens et al., 1981).

4.9.3 Water Quality

The Illinois Pollution Control Board (IPCB) sets water quality standards based upon the degree to which a water feature provides the "designated use." The degree of support (attainment) of a designated use in a particular stream segment is determined by an analysis of various types of information, including biological, physicochemical, physical habitat, and toxicity data (IEPA, 2010). Each applicable designated use in each segment is assessed as Fully Supporting (good) or Not Supporting (fair/poor) (IEPA, 2010). Waters in which at least one applicable use is not fully supported are called "impaired" (IEPA, 2010).

For Illinois streams, the major potential causes of impairment, based on number of miles affected, are fecal coliform bacteria impairing swimming (primary contact) use, mercury and polychlorinated biphenyls (PCBs) in fish tissue impairing fish consumption use, and low dissolved oxygen, high nutrients, excessive siltation, physical-habitat alterations, and high suspended solids which impair aquatic life use (IEPA, 2010). The Clean Water Act requires that all states compile a list of impaired and threatened waters. This list is referred to as the "303(d) list". The US Geological Survey (USGS) developed a standardized watershed classification system where watershed/basin boundaries are organized in a nested hierarchy by size. A watershed address consists of a name and number, called a hydrologic unit codes (HUC). Stream basins, with hydrologic unit codes (HUC) of ten digits (HUC 10) and more specifically, twelve digits (HUC 12), that are crossed by the study corridor that have been listed in the Illinois 303(d) (2010) impairment list are included below in Table 4.9-2.

Table 4.9-2. 303(d) Listed Impaired Waters in the Study Corridor

HUC_10_	HUC_12_	Designated Uses	Impairment Listing
Kankakee River	Prairie Creek	Fish Consumption/ Public Water Supplies	Mercury, Polychlorinated biphenyls/Manganese
Kankakee River	City of Wilmington-Kankakee River	Fish Consumption/ Public Water Supplies	Mercury, Polychlorinated biphenyls/Manganese
North Branch Chicago River-Chicago Sanitary and Ship Canal	South Branch Chicago River-Chicago Sanitary and Ship Canal	Fish Consumption	Polychlorinated biphenyls
Calumet Sag Channel-Little Calumet River	Calumet Sag Channel	Fish Consumption	Mercury, Polychlorinated biphenyls
Calumet Sag Channel-Little Calumet River	Midlothian Creek	Fish Consumption	Mercury, Polychlorinated biphenyls
Calumet Sag Channel-Little Calumet River	Little Calumet River	Fish Consumption/Aquatic Life/Indigenous Aquatic Life/Primary Contact Recreation	Mercury, Polychlorinated biphenyls/chlordane,endrin,fluoride,hexachlorobenzene,oil&grease,sedimentation-siltation, total phosphorus (fluoride, sedimentation-siltation, pH, total phosphorus)/aldrin, iron, silver, total phosphorus/fecal coliform
Hickory Creek	Hickory Creek	Aquatic Life, Primary Contact Recreation	Chloride, total phosphorus, Arsenic, Chloride, total phosphorus, chloride, total suspended solids, total phosphorus/fecal coliform
Hickory Creek	Spring Creek	Aquatic life	Manganese, sedimentation-siltation, total phosphorus
Chicago Sanitary and Ship Canal-Des Plaines River	Flag Creek	Aquatic Life	Arsenic, DDT, hexachlorobenzene, methoxychlor, total phosphorus

Table 4.9-2. 303(d) Listed Impaired Waters in the Study Corridor (continued)

HUC_10_	HUC_12_	Designated Uses	Impairment Listing
Chicago Sanitary and Ship Canal-Des Plaines River	Saganashkee Slough-Calumet Sag Channel	Aesthetic Quality/Aquatic Life/Fish Consumption	Total suspended solids, total phosphorus/nickel, sedimentation-siltation, silver, total suspended solids, total phosphorus/polychlorinated biphenyls
Chicago Sanitary and Ship Canal-Des Plaines River	Maple Lake-Chicago Sanitary and Ship Canal	Aesthetic Quality	Total phosphorus
Des Plaines River	Grant Creek	Aquatic Life	Unknown
Des Plaines River	Des Plaines River	Fish Consumption, Aquatic Life	Mercury, polychlorinated biphenyls/Arsenic, copper, methoxychlor, polychlorinated biphenyls ,sedimentation-siltation, total suspended solids, total phosphorus
Des Plaines River	Sugar Run	Aquatic Life	Arsenic, manganese, sedimentation-siltation, pH
Des Plaines River	Jackson Creek	Aquatic Life	Zinc, Total Phosphorus
Granary Creek-Mazon River	Town of Godley-Mazon River	Fish Consumption	Mercury, Polychlorinated biphenyls
Mazon River	Jackson Creek-Mazon River	Fish Consumption/Primary Contact Recreation	Mercury, Polychlorinated biphenyls/Fecal Coliform
North Fork Vermilion River	Smiths Branch-Vermilion River	Fish Consumption/Primary Contact Recreation/Public Water Supplies	Mercury/Fecal Coliforms/total dissolved solids, nitrogen, nitrate
Upper Vermilion River	Turtle Creek-Upper Vermilion River	Public Water Supplies	Nitrogen, Nitrate

Table 4.9-2. 303(d) Listed Impaired Waters in the Study Corridor (continued)

HUC_10_	HUC_12_	Designated Uses	Impairment Listing
Buck Creek-Mackinaw River	Turkey Creek	Aquatic Life	Total phosphorus
Buck Creek-Mackinaw River	Loving Branch-Mackinaw River	Fish Consumption	Polychlorinated biphenyls
Sixmile Creek-Mackinaw River	Evergreen Lake-Sixmile Creek	Fish Consumption	Mercury
Sugar Creek	Sugar Creek Channel	Aquatic Life	Boron, Total Phosphorus
Sugar Creek	Lake Springfield-Sugar Creek	Aesthetic Quality	Total suspended solids, total phosphorus
Sugar Creek	Hoover Branch-Sugar Creek	Aquatic Life	Sedimentation-siltation
Sugar Creek	Town of Shirley-Sugar Creek	Aquatic Life	Total phosphorus, and unknown
Sugar Creek	City of Normal-Sugar Creek	Aquatic Life	Total phosphorus, and unknown
Sugar Creek	Town of McLean-Sugar Creek	Aquatic Life	Total phosphorus, and unknown
Judys Branch-Mississippi River	Horseshoe Lake	Aesthetic Quality/Fish Consumption	Total suspended solids, total phosphorus/Polychlorinated biphenyls

4.9.4 Special Status Streams

The National Wild and Scenic Rivers System was created by Congress in 1968 (Public Law 90-542; 16 U.S.C. 1271 et seq.) to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations (www.rivers.gov). Rivers are classified as wild, scenic, or recreational based on the following criteria:

- Wild river areas — Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.

- Scenic river areas — Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.
- Recreational river areas — Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

Streams within the study corridor considered to have outstanding resource value according to the National Parks Service include: Des Plaines River, Mazon River, Vermilion of the Illinois River, Vermilion river, Mackinaw River, Sangamon River, Manhattan Creek and Kickapoo Creek. These streams are shown on Exhibit 4.9-4. None of the rivers within the study corridor are considered Wild, Scenic or Recreational areas by federal or state agencies.

In 1992, the Illinois Natural History Survey (INHS) published a list of biologically significant streams (BSS) for the purpose of conserving biodiversity across the state (http://www.dnr.state.il.us/orc/BioStrmRatings/). Streams within the study corridor that are considered biologically significant streams include: Kankakee River, Vermilion River, Salt Creek, Wolf Creek, and Kickapoo Creek (http://www.dnr.state.il.us/orc/BioStrmRatings). These streams are shown on Exhibit 4.9-5.

The Nationwide Rivers Inventory (NRI) is a listing of more than 3,400 free-flowing river segments in the United States that are believed to possess one or more "outstandingly remarkable" natural or cultural values judged to be of more than local or regional significance. Under a 1979 Presidential Directive, and related Council on Environmental Quality procedures, all federal agencies must seek to avoid or mitigate actions that would adversely affect one or more NRI segments. Segments within the study corridor include the following: Des Plaines River (Cook, Dupage), Mackinaw River (McLean), Mazon River (Grundy, Livingston), and Sangamon River (McLean, Sangamon). (http://www.nps.gov/ncrc/programs/rtca/nri/states/il.html) These segments are shown on Exhibits 4.9-6 through 4.9-8.

Navigable waters of the United States are waters defined as all navigable waters of the United States, and tributaries of such waters as interstate waters; intrastate lakes, rivers, and streams which are utilized by interstate travelers for recreational or other purposes; and intrastate lakes, rivers, and streams from which fish or shellfish are taken and sold in interstate commerce (http://www.epa.gov/osweroe1/content/spcc/spcc_nov08waters.htm). The United States Army Corps of Engineers issues permits for impacts to navigable waters or waters with a significant nexus to a navigable water. As a result, any navigable waters or any streams and wetlands crossed by the study corridor that may be considered to have a significant nexus with navigable waters would require permits. Navigable waters within the study corridor include the Kankakee River,

Mackinaw River, Mississippi River, Sangamon River, Salt Creek, and Sugar Creek. These waters are shown on Exhibits 4.9-6 through 4.9-8.

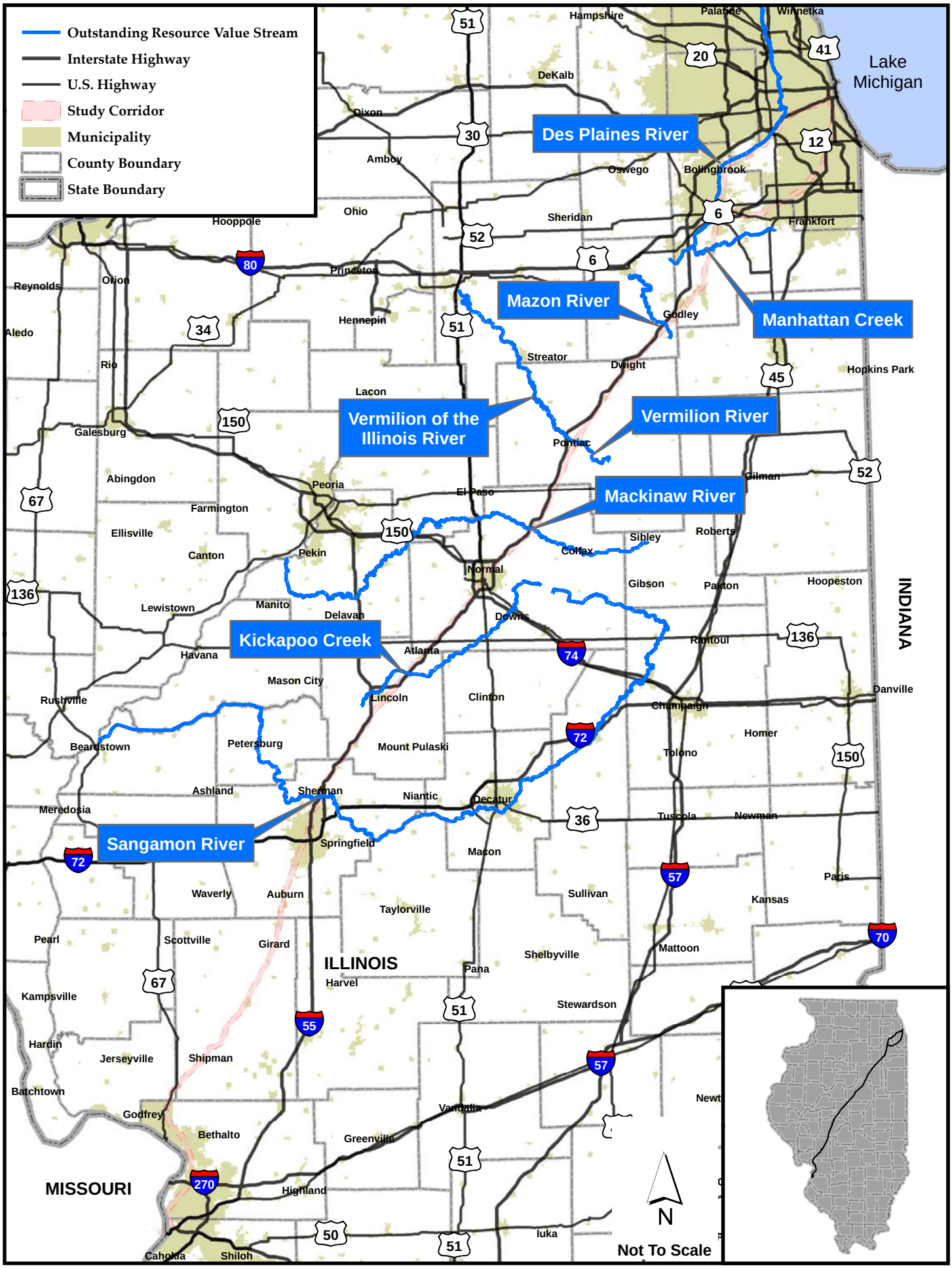


Exhibit 4.9-4. Outstanding Resource Value Streams

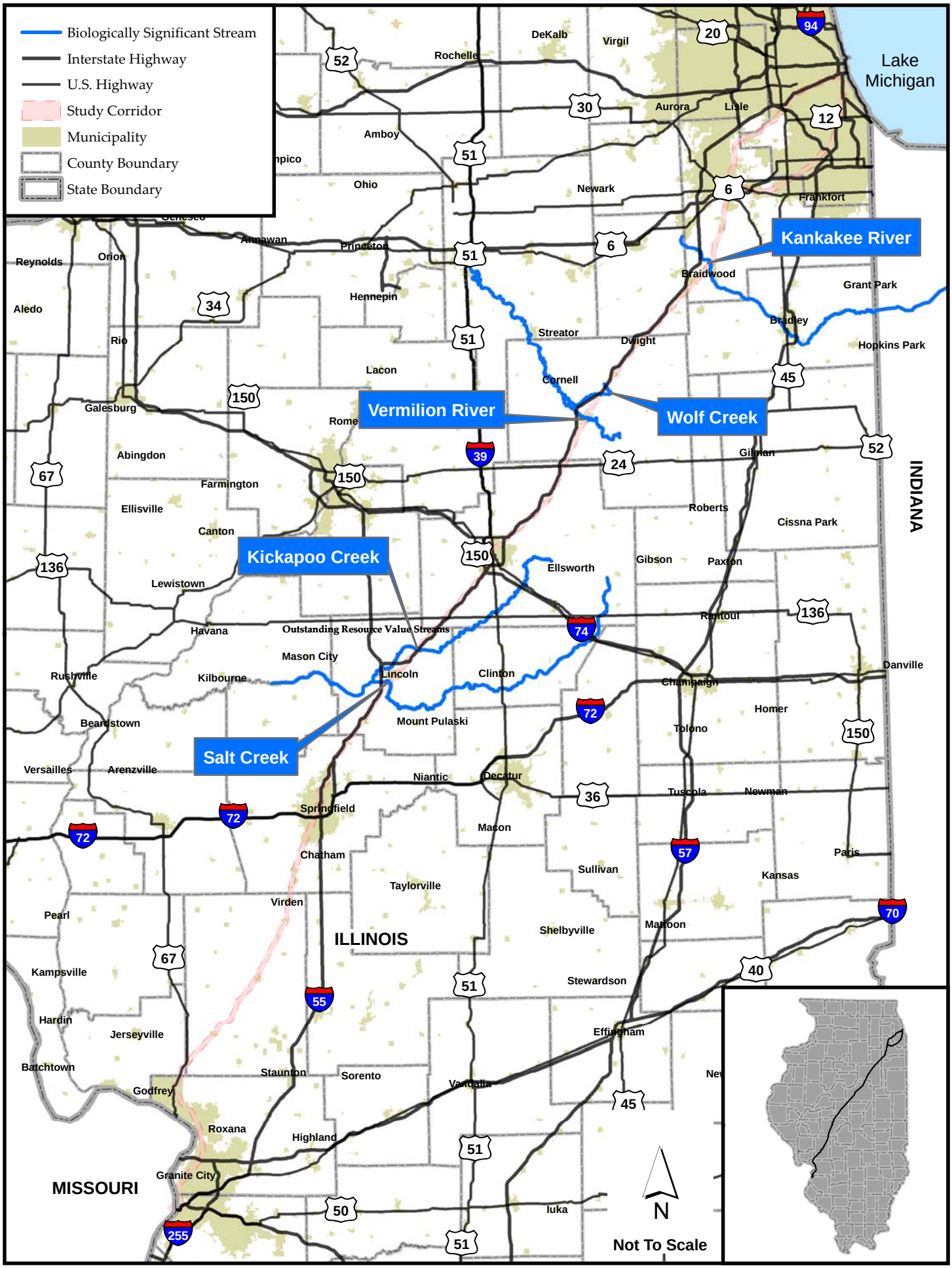


Exhibit 4.9-5. Biologically Significant Streams

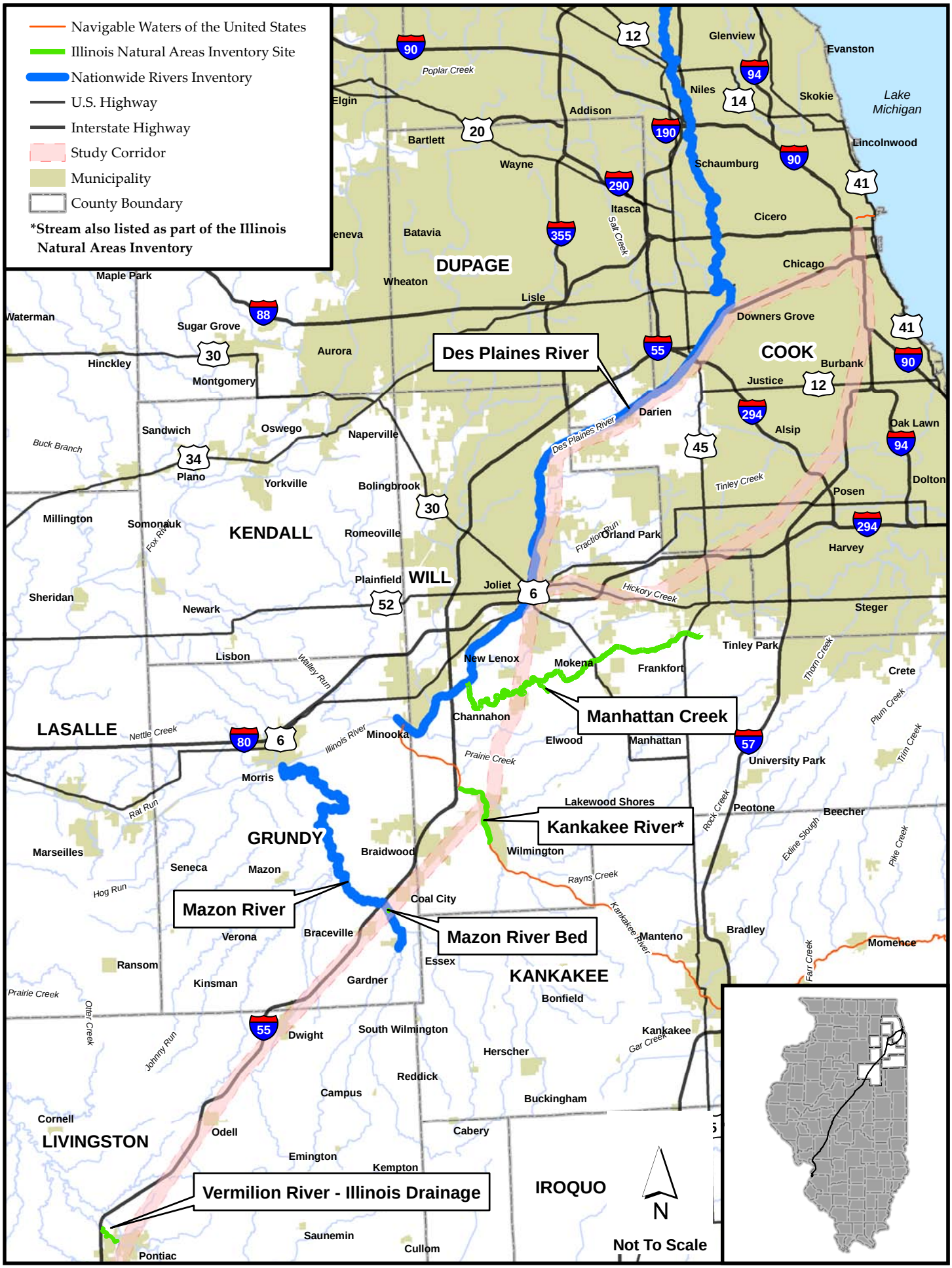


Exhibit 4.9-6. Aquatic Features (1 of 3)

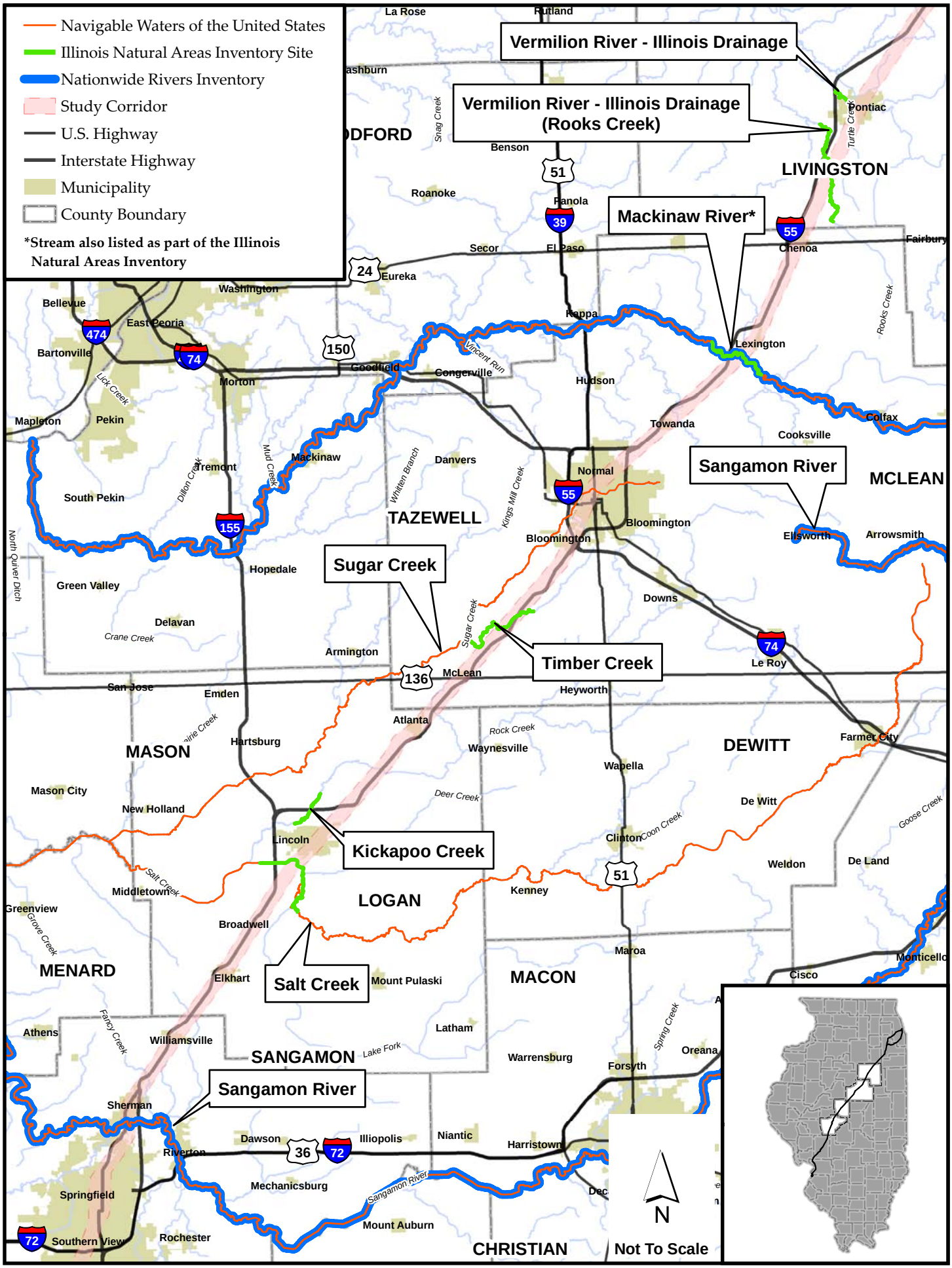


Exhibit 4.9-7. Aquatic Features (2 of 3)

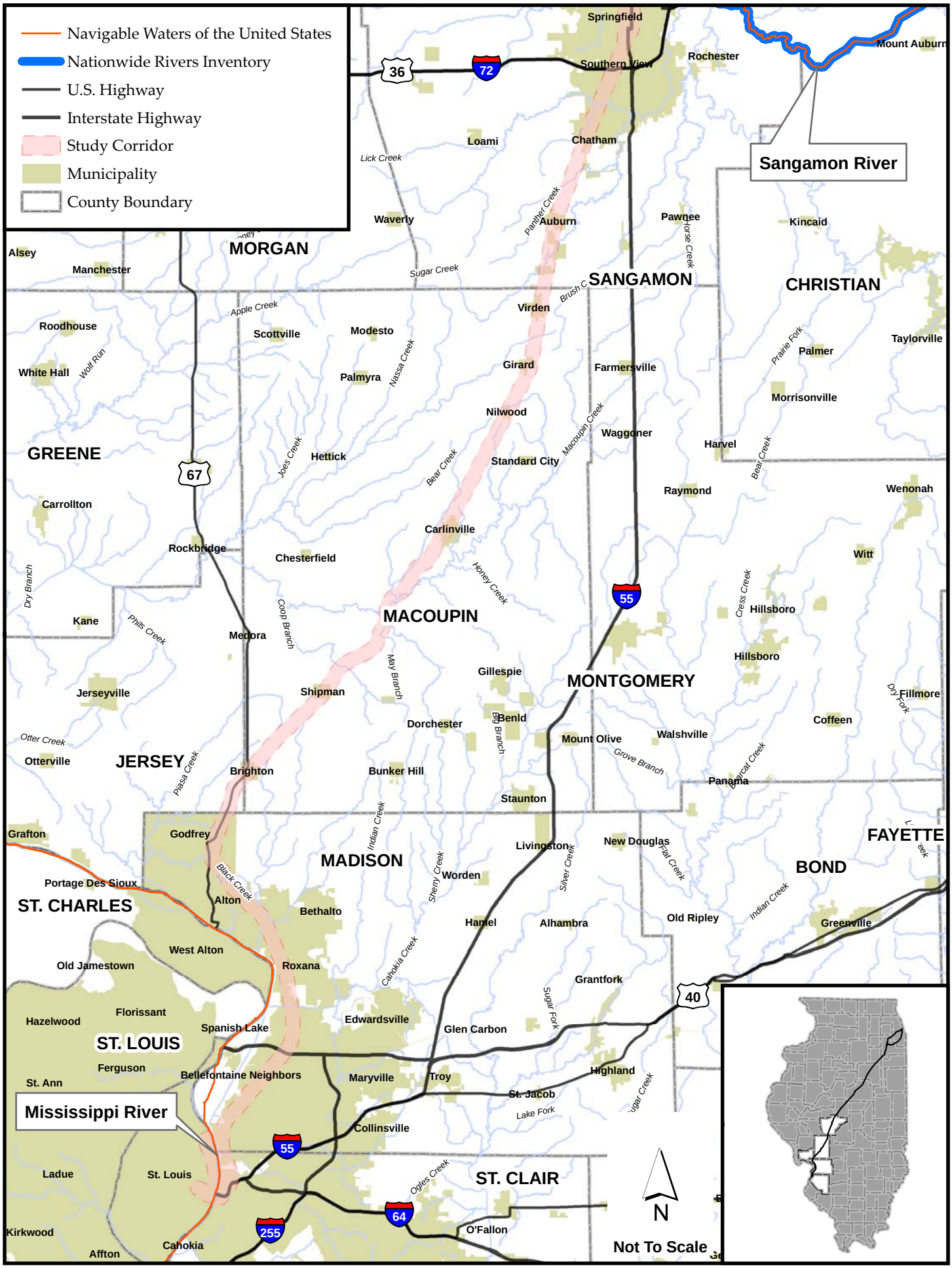


Exhibit 4.9-8. Aquatic Features (3 of 3)

The INAI provides a set of information about high quality natural areas, habitats of endangered species, and other significant natural features. INAI streams within the study corridor include the Kankakee River, Mackinaw River, Vermillion River (Illinois drainage), Vermillion River (Rooks Creek), Timber Creek, Manhattan Creek, and Salt Creek. These streams are shown on Exhibits 4.9-6 through 4.9-8.

4.9.5 Groundwater

An aquifer is an area containing saturated (with groundwater) soils and geologic materials that are sufficiently permeable to readily yield economically useful quantities of water to wells, springs, or streams under ordinary hydraulic gradients (http://dot.state.il.us/water.html). Illinois aquifers are generally composed of unlithified well-sorted sand and gravel deposits, or bedrock units composed of porous sandstone, or fractured carbonate bedrock (Berg et al., 1984). Within the study corridor, sand and gravel aquifers can be found in the Cook, Logan, Madison, McLean, Sangamon, and Will counties. Shallow bedrock aquifers are located in Cook and Will counties, while deep bedrock aquifers are found in other areas of northeastern Illinois.

Approximately 70 percent of community water supplies (CWS) in the state withdraw water from confined aquifers that have natural geologic protection from surface and near surface activities (http://www.gwpc.org/e- library/documents/state_fact_sheets/ illinois.pdf). In many industrialized parts of the state (including the metropolitan areas of Chicago, Rockford, and East St. Louis), groundwater in glacial deposits and bedrock aquifers has been degraded by improperly contained or disposed of chemicals (http://www.gwpc.org/e-library/documents/state_fact_sheets/illinois.pdf). Groundwater resources are most susceptible in shallow coarse grained aquifers. In these areas the potential for contamination becomes high (Berg and Kempton 1984) due to proximity to the surface and rapid recharge. The study corridor includes 165,000 acres of areas with shallow course grained aquifers.

There are 245 CWS wells located within the study corridor. Many of these wells have established setbacks of 200 feet or more, and construction may be restricted within the setback zone. There are 113 wells associated with wellhead protection areas within the study corridor. Communities may have local ordinances that control land use within the wellhead protection area or setback zone.

There are eight CWS that have designated surface water protection areas crossed by the study corridor. These include five Zone 1 areas. Zone 1 areas are protected zones that extend 0.25 mile upstream of CWS intakes. These zones represent a maximum 5-hour travel time of contaminants to the intake. Three CWS have designated the entire watershed above their intakes as source water protection zones. The management of these watersheds may vary by community but may include land use restrictions, use of best management practices, and notification of the use and storage of chemicals.

Exhibits 4.9-9 through 4.9-11 show the location of areas of shallow coarse grained aquifers, CWS wells, wellhead protection areas, Zone 1 surface water protection areas and CWS watersheds.

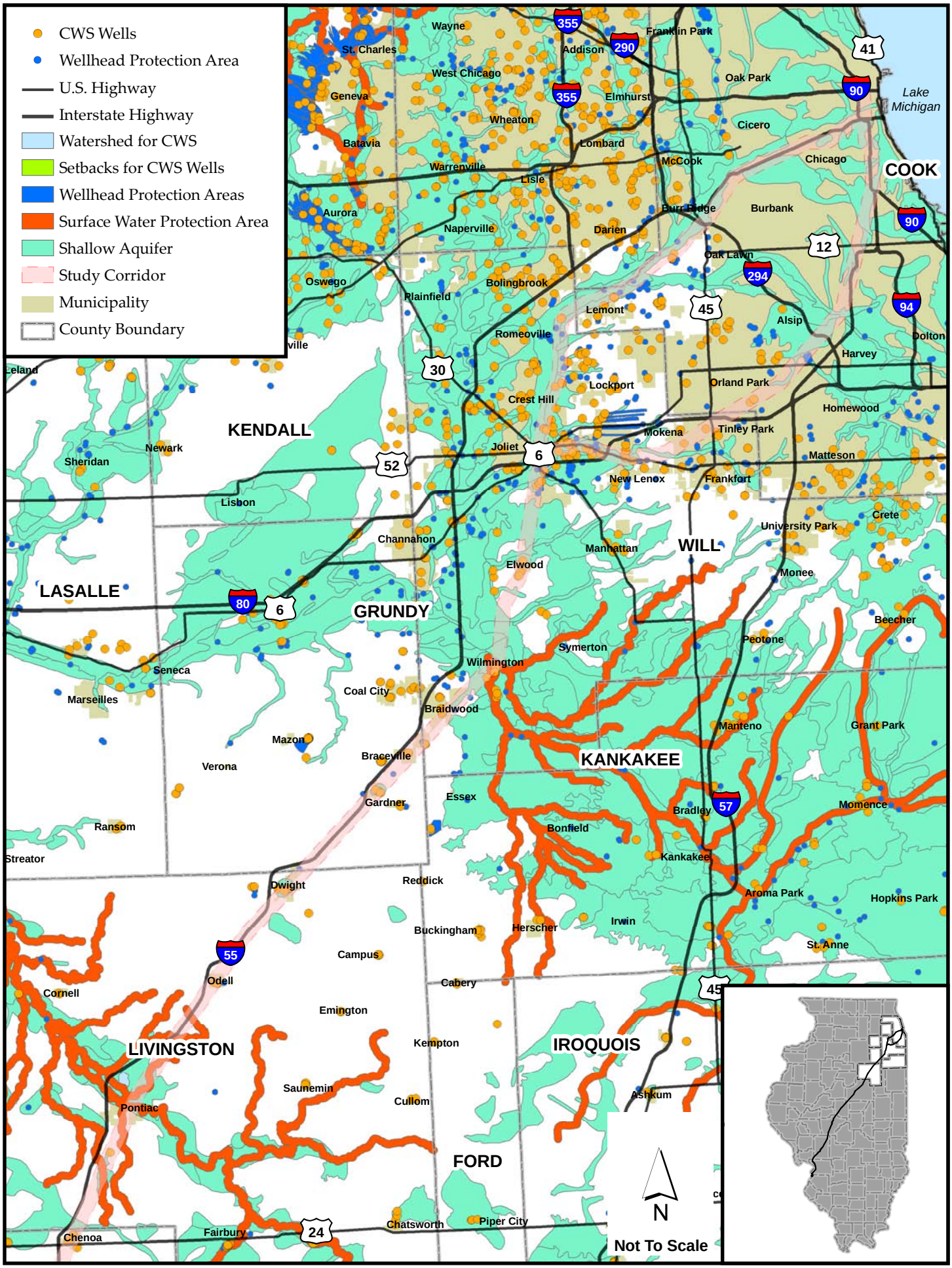


Exhibit 4.9-9. Water Supply Resources (1 of 3)

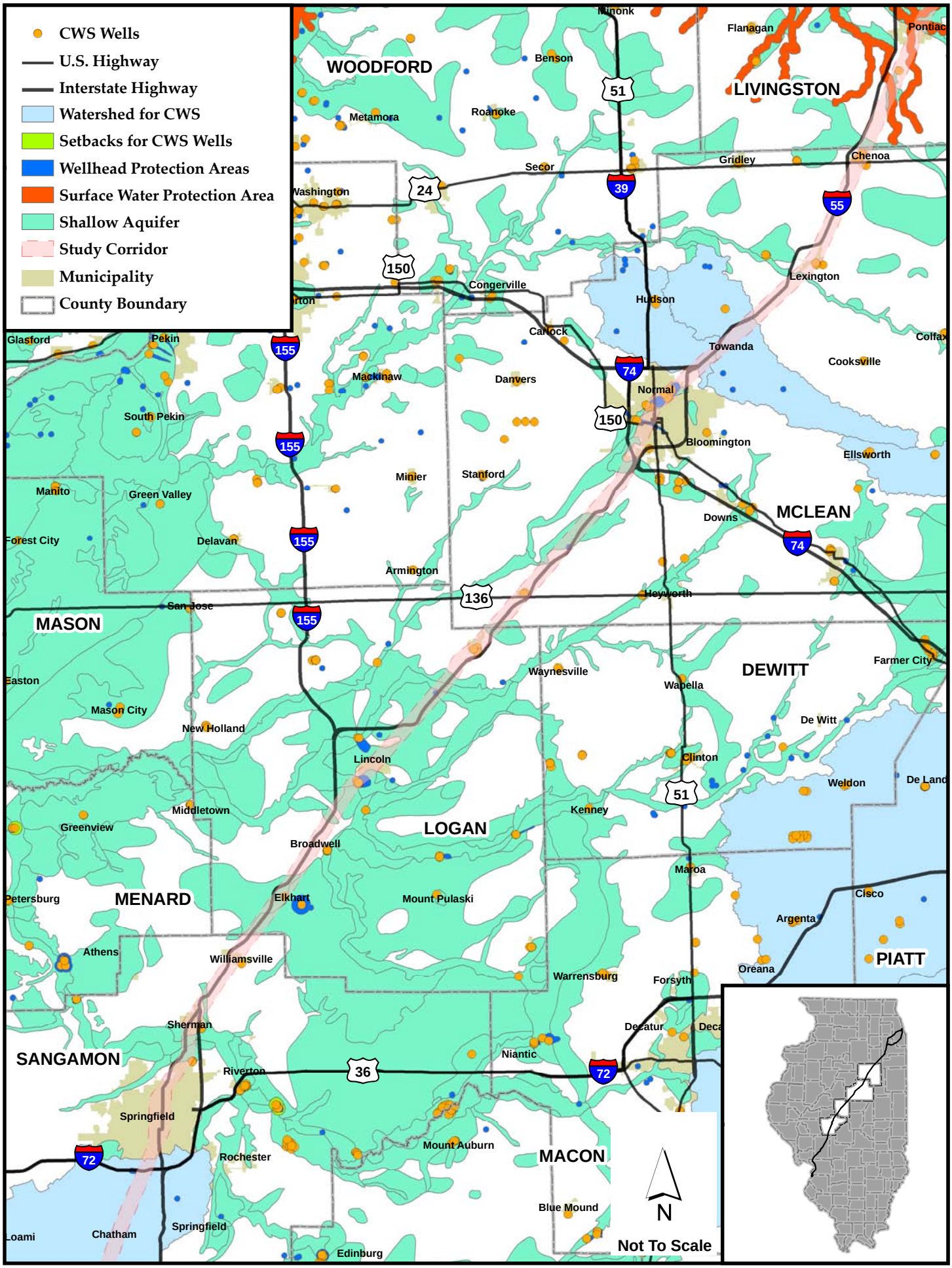


Exhibit 4.9-10. Water Supply Resources (2 of 3)

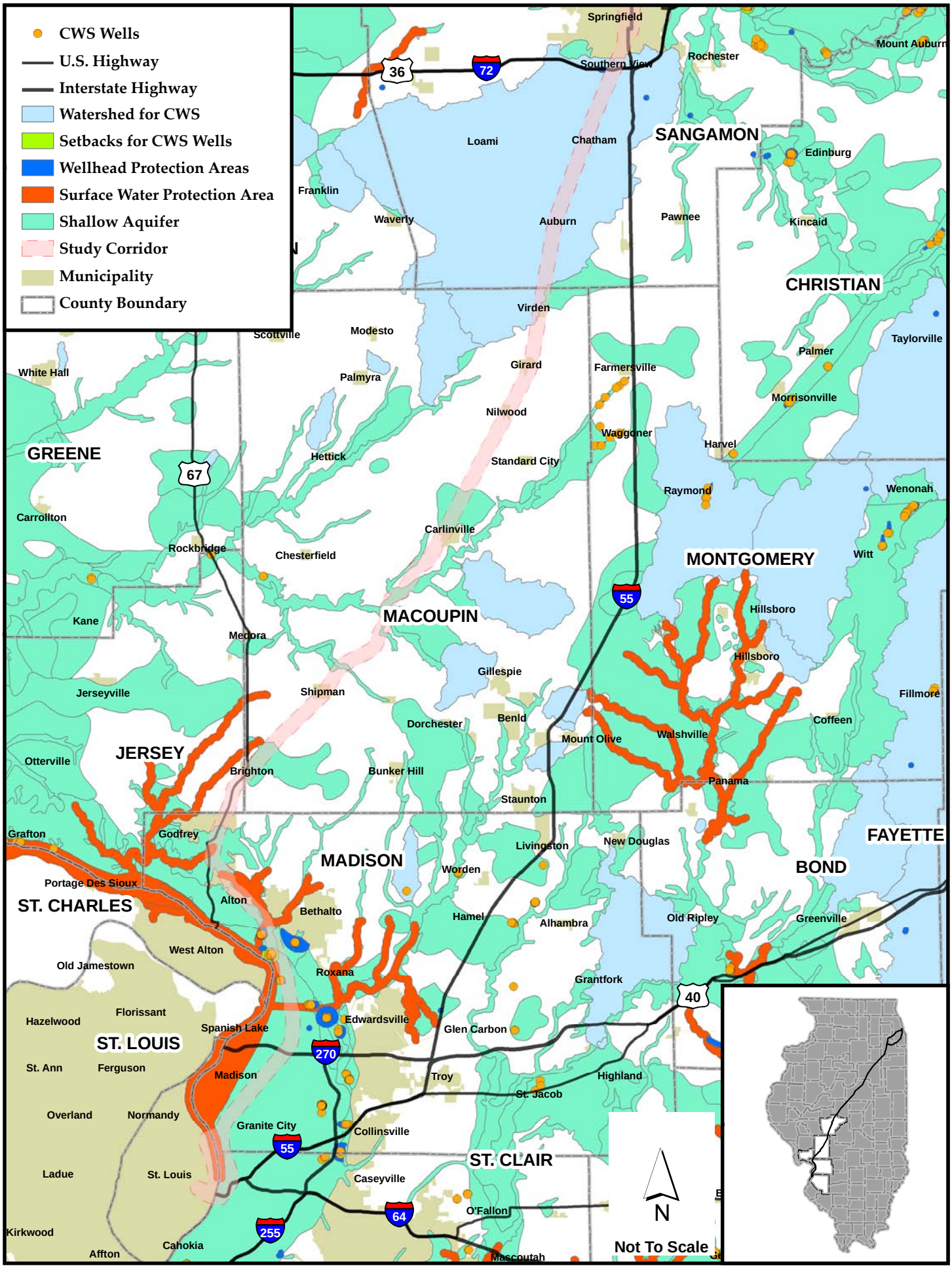


Exhibit 4.9-11. Water Supply Resources (3 of 3)

4.10 Floodplains

The Federal Emergency Management Agency (FEMA) identifies 100-year floodplains, or Special Flood Hazard Areas. The 100-year floodplain is defined as the area that will be inundated by a flood event having a one percent probability of being equaled or exceeded in any given year.

The study corridor crosses several 100-year floodplains from Chicago to St. Louis. The most recent floodplain mapping from FEMA was used to inventory existing floodplains and prepare mapping of 100-year floodplains within a one-mile wide study corridor between Chicago and St. Louis. FEMA 100-year floodplains encompass approximately 10,406 acres or 5.0 percent of the study corridor. The major 100-year floodplain streams located within the study corridor are listed in Table 4.10-1. These floodplain areas are shown on Exhibits 4.10-1 through 4.10-3.

Table 4.10-1. Major 100-year Floodplain Streams within Study Corridor

Stream Name	
Buck Creek	Midlothian Creek
Clear Creek	Money Creek
Des Plaines River	Panther Creek
Fancy Creek	Prairie Creek
Fiddyment Creek	Polecat Creek
Goose Creek	Rooks Creek
Grant Creek	Salt Creek
Hickory Creek	Sangamon River
Hurricane Creek	Sugar Creek
Kickapoo Creek	Timber Creek
Lick Creek	Turkey Creek
Long Run	Unnamed Tributary to Des Plaines River
Macoupin Creek	Unnamed Tributary to Grant Creek
Manhattan Creek	Unnamed Tributary to Hickory Creek
May Branch	Unnamed Tributary to Prairie Creek
Mazon River	Wood River

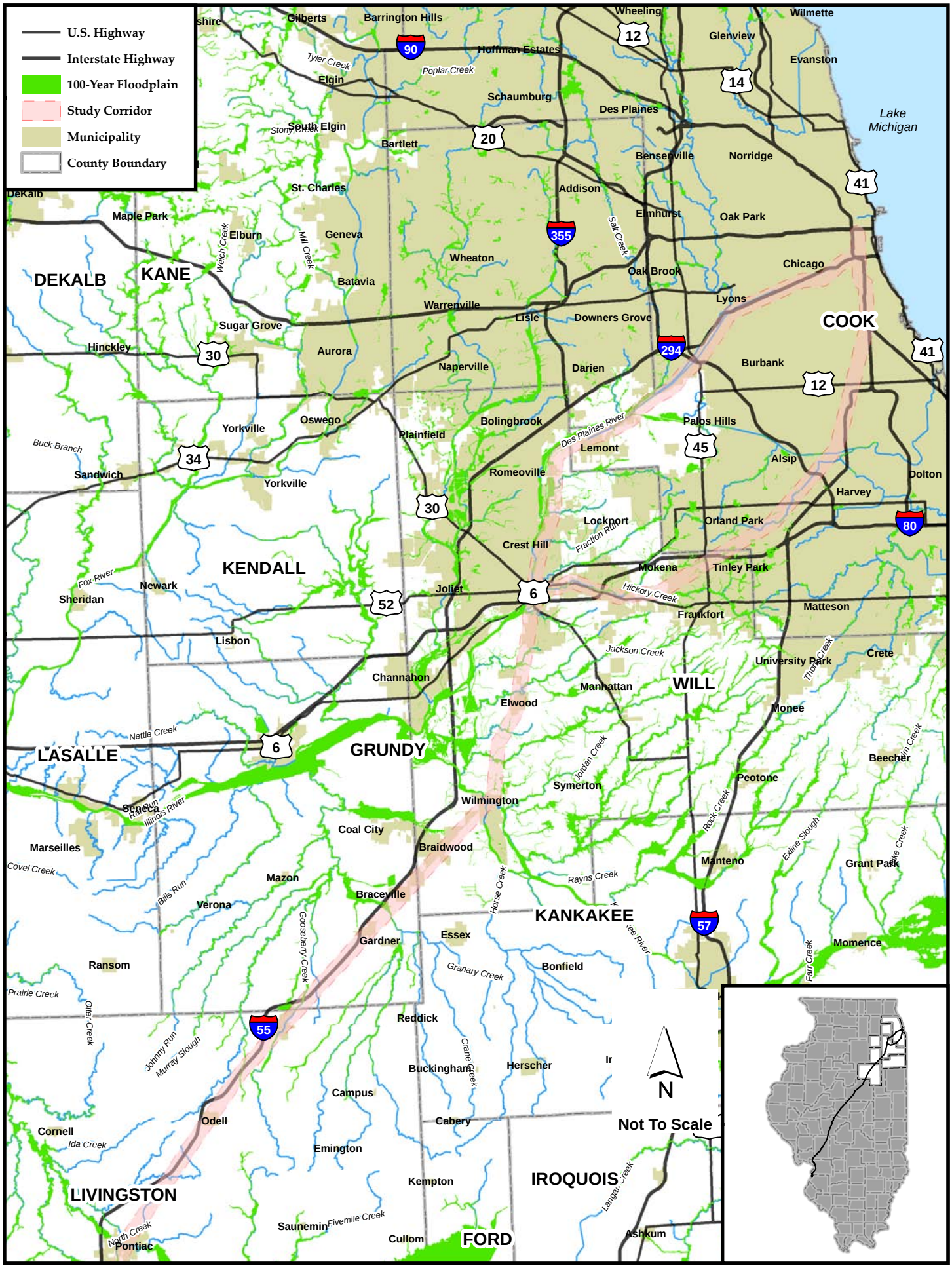


Exhibit 4.10-1. 100 Year Floodplain (1 of 3)

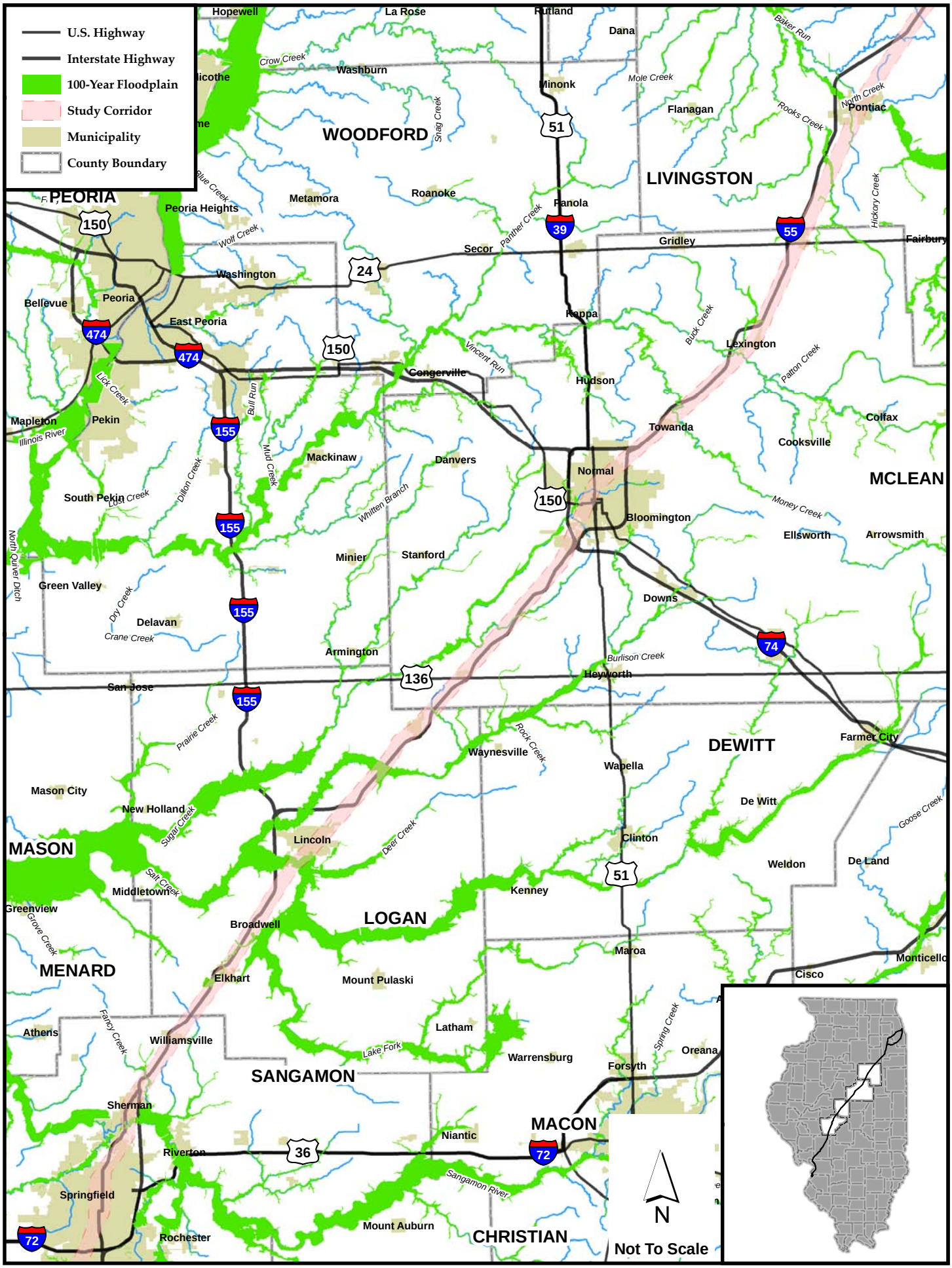


Exhibit 4.10-2. 100 Year Floodplain (2 of 3)

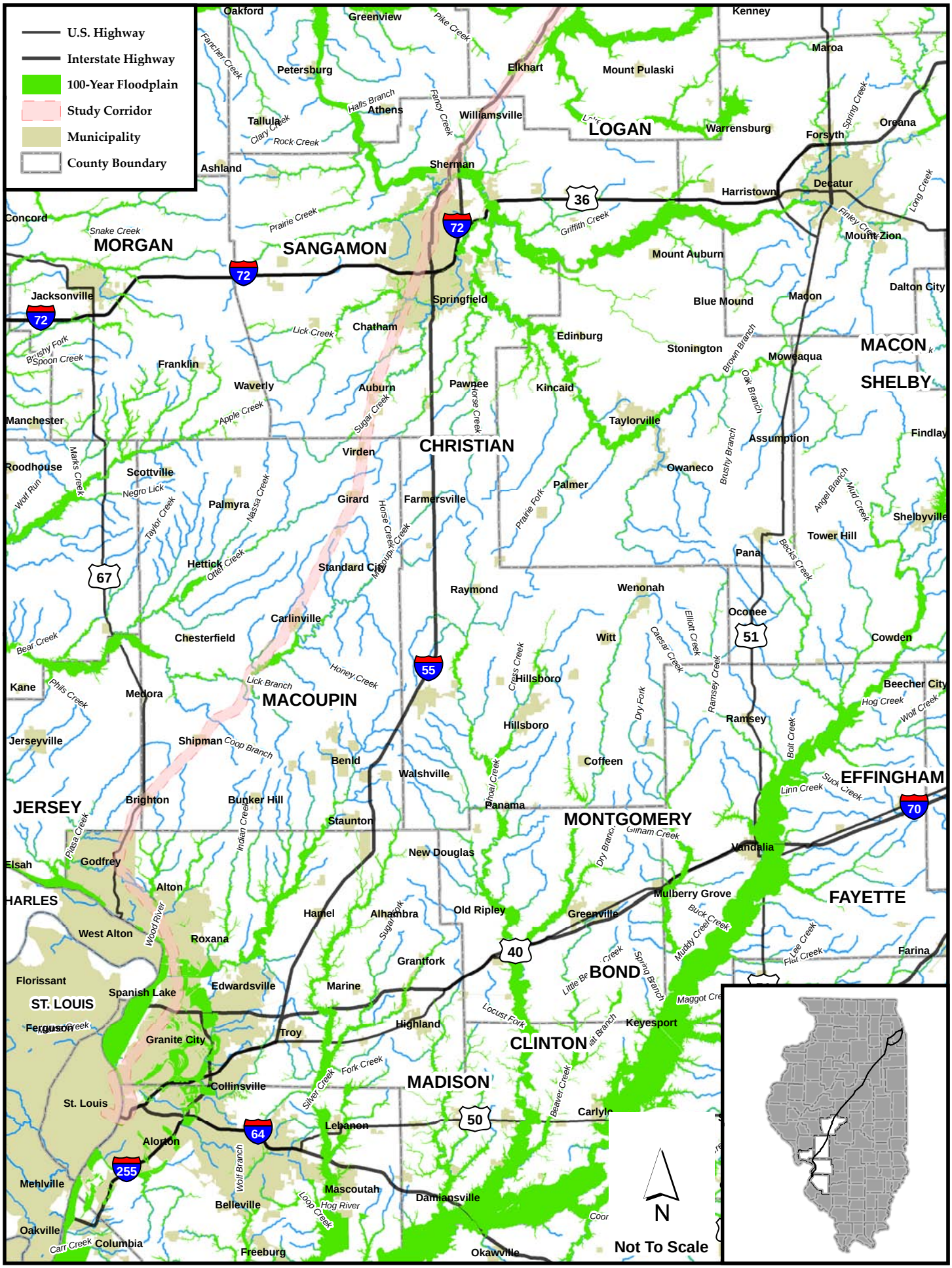


Exhibit 4.10-3. 100 Year Floodplain (3 of 3)

4.11 Wetlands

Wetlands are natural areas that are often wet but may not be wet all year, and they are characterized by their distinctive hydrology, soils, and vegetation. Wetlands are important features in the landscape that provide beneficial functions such as protecting and improving water quality, storing floodwaters, maintaining surface water flow during dry periods, and providing wildlife habitat. Section 404 of the Clean Water Act provides protection for wetlands and other waters of the U.S. and gives the U.S. Army Corps of Engineers jurisdiction to regulate the discharge of fill materials into these water resources.

The type of vegetation and duration of hydrology are the primary factors used to classify wetland communities. The primary wetland communities within the study corridor are palustrine (i.e., freshwater) emergent (PEM), palustrine forested/scrub-shrub (PFO/PSS), palustrine unconsolidated bottom (PUB) (i.e., ponds), lacustrine (L) (i.e., lakes), and riverine (R) (i.e., rivers) based on the Cowardin classification system (Cowardin et al., 1979).

National Wetland Inventory (NWI) mapping from the USFWS was used to inventory existing wetlands within a one-mile wide study corridor from Chicago to St. Louis. No field investigations were conducted to verify this information. These wetlands are shown on Exhibits 4.11-1 through 4.11-3.

NWI wetlands encompass approximately 9,915 acres or 4.8 percent of the study corridor. Approximately 15.9 percent of the wetlands are classified as PEM; 27.8 percent are PFO/PSS; 15.5 percent are PUB, 11.7 percent are lacustrine; and 29.1 percent are riverine. The larger wetlands are associated with streams and floodplains, with smaller wetlands scattered throughout the study corridor. The area of wetlands found within the study corridor is shown by type in Table 4.11-1.

Table 4.11-1. Acreage of NWI Wetland Types within the Study Corridor

Wetland Type	Acres
PEM	1,573
PFO/PSS	2,759
PUB	1,539
Lacustrine (L)	1,160
Riverine (R)	2,884
Total	9,915

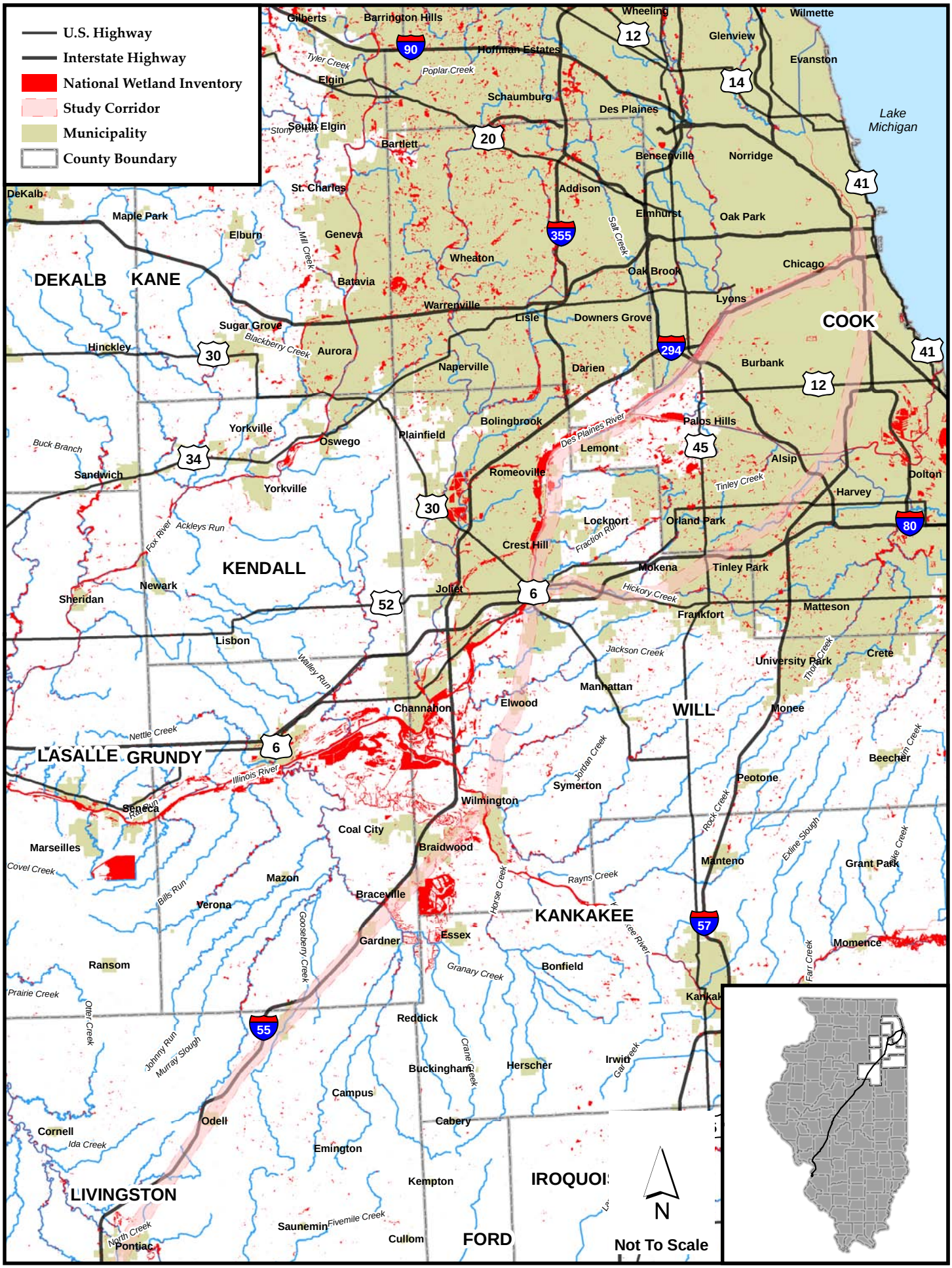


Exhibit 4.11-1. National Wetland Inventory (1 of 3)

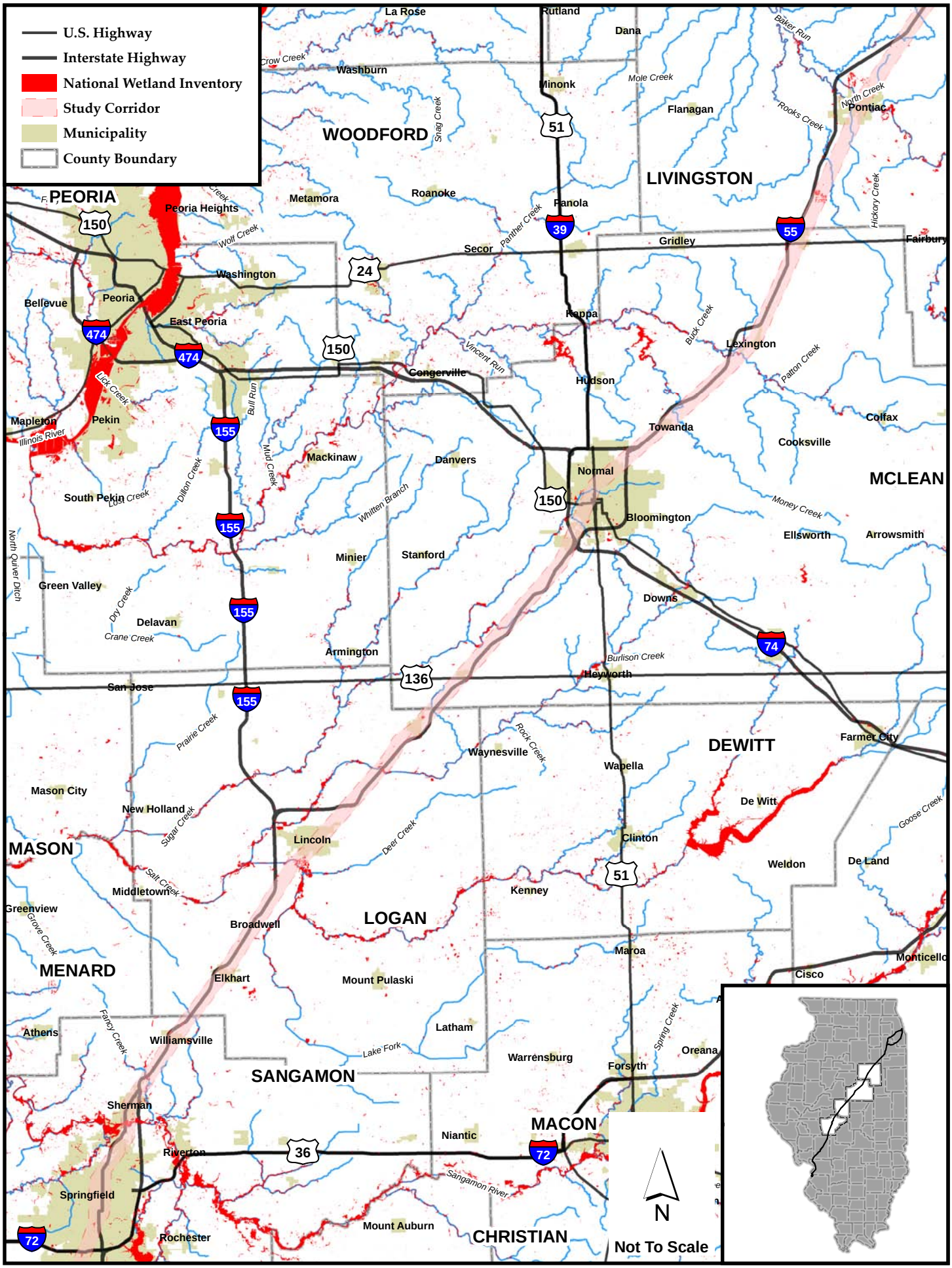


Exhibit 4.11-2. National Wetland Inventory (2 of 3)

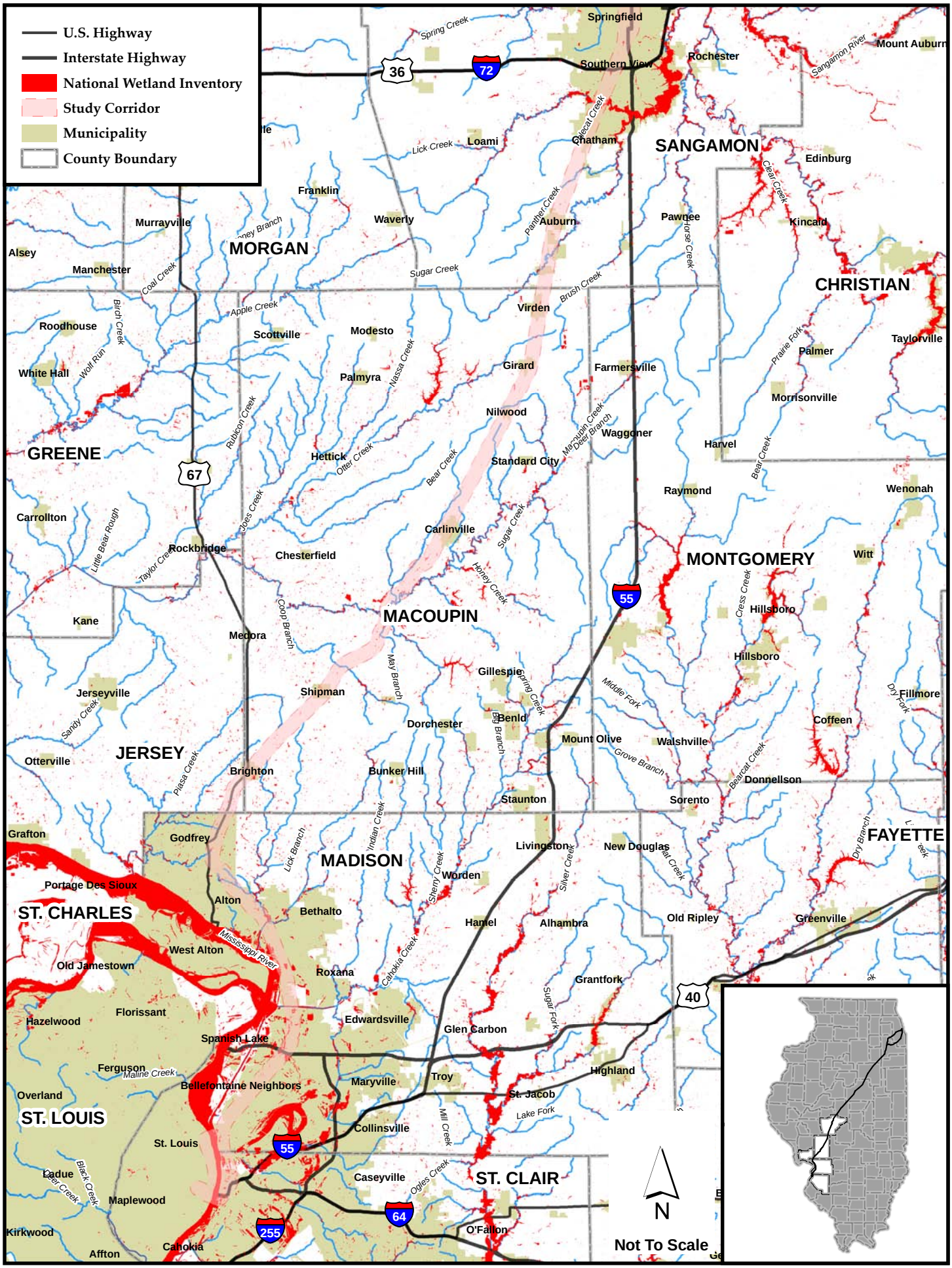


Exhibit 4.11-3. National Wetland Inventory (3 of 3)

4.12 Utilities

Throughout the study corridor between Chicago and St. Louis, utilities are running parallel to and crossing the existing and proposed rail locations. Rural areas of the study corridor typically include fiber optic and other communication lines sharing right-of-way along the railroad while utility crossings of communication, gas and power utilities typically occur at the rural roadway crossings. Within urban areas, many more utility crossings occur with additional utilities such as sanitary sewer, water, storm sewer in addition to communication, gas and electric. Major oil and gas pipelines are also known to occur along the study corridor, but the locations of these are not readily identifiable and information on their locations is not readily available at the Tier 1 study level. Additional information would be gathered in Tier 2 to coordinate the location and identification of specific impacts to utilities.

4.13 Visual and Aesthetic Quality

4.13.1 Guidance

This section describes the existing visual environment of the study corridor, including scenic resources. Aesthetics and visual resources are natural and cultural landscape features that people see and that contribute to the public's appreciative enjoyment of the environment. The visual environment is a critical element in people's daily experience and is often a defining factor of their quality of life.

Because FRA does not have its own separate guidance for assessing visual and aesthetic quality, this study used FHWA guidance titled *Visual Impact Assessment for Highway Projects* (USDOT 1983). Under the FHWA guidance, the visual environment is categorized into the following three geographic levels:

- Regional Landscapes – Regional landscapes are discussed in terms of landform, topography, and/or land cover components, which include water, vegetation, and manmade development.
- Landscape Units – Landscape units are within the regional landscape and are essentially "outdoor rooms" that often correspond to places or districts that are named (i.e. downtown). Landscape units are usually enclosed by clear landform or land cover boundaries.
- Visual Survey Locations – Visual survey locations are locations of specific interest to persons within the larger regional landscape and landscape unit. Attributes of visual survey locations are described in terms of visual character, visual quality, and visually sensitive resources.

4.13.2 Application of FHWA Guidance

The study corridor contains five regional landscapes: Northeastern Morainal, Grand Prairie, Western Forest-Prairie, Middle Mississippi Border, and Lower Mississippi River Bottomlands (INHS, 1996). The Northeastern Morainal region in northeastern Illinois

(Cook and Will counties) has diverse wetland, prairie, forest, savanna, and lake communities. This section hosts the greatest biodiversity in Illinois and the largest human population. As is true statewide, natural land cover has been extensively altered through agricultural activities and development and urbanization, though urbanization is considerably more extensive in this region than elsewhere. The Grand Prairie region of central and east-central Illinois (Will, Grundy, Livingston, McLean, Logan, and Sangamon counties) is a vast plain formerly occupied primarily by tallgrass prairie, now converted extensively to agriculture. The Western Forest-Prairie region (Macoupin and Madison counties) is forested in riparian zones and on steep hillsides and has agricultural and rural grasslands in its upland areas. The Middle Mississippi Border region (Madison County) is a relatively narrow band of river bluffs and rugged terrain bordering the Mississippi River floodplain, and the Lower Mississippi River Bottomlands (Madison and St. Clair counties and City of St. Louis) contain the Mississippi River and its floodplain (INHS, 1996). Several landscape units and visual survey locations, as shown on Table 4.13-1, are found within the five regional landscapes of the study corridor.

4.13.3 Visual Quality of the Study Area

The study area for aesthetics and visual resources includes much of the study corridor's viewshed (i.e., the areas that could potentially have views of the study corridor and the areas from which viewers from trains could potentially see as they travel through the landscape). The visual environment of the study corridor ranges from undeveloped agricultural areas and small towns to large-scale industrial development and vibrant urban districts. Most of the study corridor consists of rural or single family residential and agricultural areas with flat topography. The majority of the existing rail corridor supports active freight and passenger rail service, while part of the rail corridor supports only freight service.

Heavy industrial views are predominant along the existing tracks in Cook County between Chicago and Lemont. The viewsheds in Lockport, Joliet, and Elwood in Will County provide a mixture of retail commercial, institutional, and recreational land uses in proximity to the railroad. South of Elwood the railroad passes through more than 4 miles of the Midewin National Tallgrass Prairie. The Midewin National Tallgrass Prairie is a 16,000-acre prairie parkland that serves as both a nature preserve and a recreational open space with biking and hiking trails. The Midewin National Tallgrass Prairie adds notable visual quality in comparison to some industrial and agricultural settings.

Table 4.13-1. Landscape Regions, Units, and Visual Survey Locations

Landscape Region	Landscape Unit	Visual Survey Location
Northeastern Morainal	Chicago Area Joliet Area	Industrial
		Commercial
		Residential
		Agricultural
		Forest/Open Space
		Unique Landscapes (Historic Sites and Special Lands)
Grand Prairie	Will County Grundy County Livingston County McLean County Bloomington-Normal Area Logan County Sangamon County Springfield Area	Industrial
		Commercial
		Residential
		Agricultural
		Forest/Open Space
		Unique Landscapes (Midewin National Tallgrass Prairie, Historic Sites, and Special Lands)
Western Forest-Prairie	Madison County	Industrial
		Commercial
		Residential
		Agricultural
		Forest/Open Space
		Unique Landscapes (Historic Sites and Special Lands)
Middle Mississippi Border	Madison County	Industrial
		Commercial
		Residential
		Agricultural
		Forest/Open Space
		Unique Landscapes (Historic Sites and Special Lands)
Lower Mississippi River Bottomlands	St. Louis Area	Industrial
		Commercial
		Residential
		Agricultural
		Forest/Open Space
		Unique Landscapes (Historic Sites and Special Lands)

Outside of the small agricultural towns in Grundy, Livingston, Logan, Macoupin, and Jersey counties, the railroad passes through mostly agricultural areas. Overall visual quality is good, though they possess few uncommon or distinguishing visual features. The visual setting in Mclean County is mostly agricultural, except for the community of Bloomington-Normal. The Bloomington-Normal viewshed contains industry, commercial and educational facilities, and residential areas.

Outside of Springfield, the visual setting in Sangamon County is characteristic of that in predominantly agricultural areas. Within Springfield the views are generally mixed around the railroad with a high concentration of government buildings and businesses in the downtown district.

The study corridor extends for approximately 27 miles in Madison County, 4 miles in St. Clair County, and 2 miles in the City of St. Louis, passing through urbanized, incorporated communities with heavy industrial uses.

Several Illinois laws and features positively contribute to the aesthetics and visual quality of the study corridor.

4.13.3.1 Illinois Scenic Byways Program

Under the National Scenic Byways Program, the U.S. Secretary of Transportation can recognize roads that possess outstanding scenic, historic, recreational, cultural, archeological, and/or natural qualities by designating them as either National Scenic Byways or All-American Roads. The seven National Scenic Byways in Illinois are: Great River Road, Historic National Road, Historic Route 66, Illinois Lincoln Highway, Illinois River Road, Meeting of The Great Rivers, and Ohio River Scenic Byway. Historic Route 66 follows a similar route to the study corridor between Chicago and St. Louis. The federal law that created the Illinois Scenic Byways Program includes a prohibition of new off-site advertising along nationally designated roadways. Illinois Scenic Byways are shown on Exhibit 4.13-1.

4.13.3.2 Illinois Department of Natural Resources Greenways & Trails Program

Greenways protect green corridors that provide and connect open space, and the trails program provides long-distance trails in new locations and connects and improves existing trails (IDNR, 2009). The Greenways & Trails Program worked with partnerships to develop and promote the Grand Illinois Trail, Mississippi River Trail, and the Route 66 Trail.

4.13.3.3 Natural Areas/Open Spaces

Northern and Central Illinois have several large reserves of natural and wildlife management areas. Natural Areas adjacent to or near the study corridor include the Midewin National Tallgrass Prairie, Funk's Grove Nature Preserve, Thaddeus Stubblefield Grove Nature Preserve, Denby Prairie Nature Preserve, Beaver Dam State Park, Edwin R. Madigan State Fish and Wildlife Area, Cook County Forest Preserve, and others. Natural Areas are shown in Section 4.6.4, Exhibits 4.6-9 through 4.6-11.

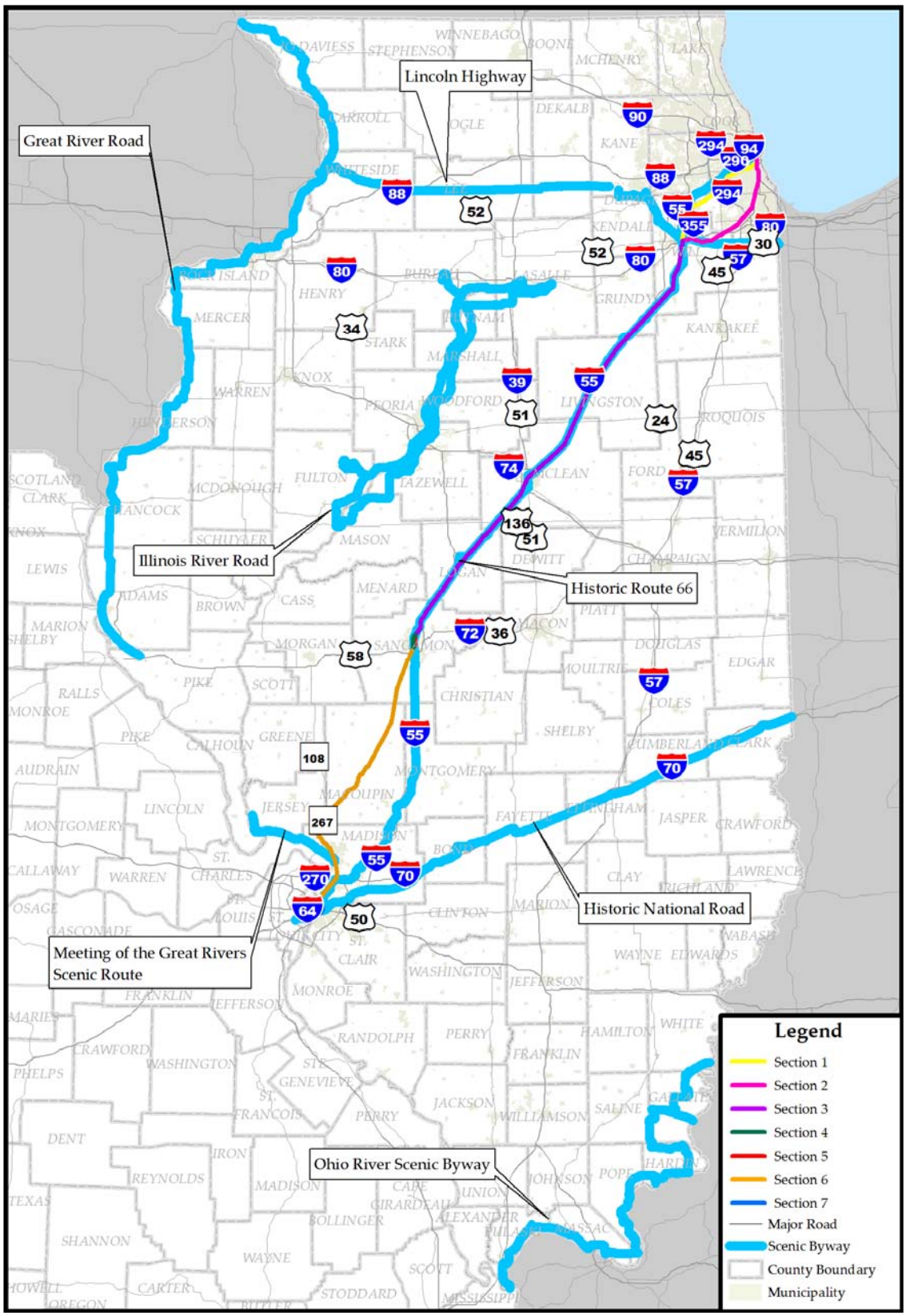


Exhibit 4.13-1. Illinois Scenic Byways

4.14 Special Waste

A screening of special waste sites was performed and documented for the study corridor using a search of records contained in federal and state databases. The objective of this effort was to identify areas where additional screening will be necessary to determine the presence and extent of potential special waste sites within the study corridor.

Records were searched by Environmental Data Resources, Inc (EDR). The search was limited to a one-mile wide corridor (0.5 mile on each side of the centerline). A total of 6,664 records were identified, associated with 1,110 individual sites from 93 state and federal record databases. Many of the programs have overlapping coverage, and many sites have multiple record associations. The effort was focused on records associated with the types of sites listed in Table 4.14-1, which are most likely to require additional screening due to the presence of special waste. Sites with these types of records are shown on Exhibits 4.14-1 through 4.14-3.

Table 4.14-1. Environmental Databases

Database	Abbreviation	Agency
Proposed National Priority List Sites	PROPOSED NPL	USEPA
Risk Management Plans	RMP	USEPA
Comprehensive Environmental Response, Compensation, and Liability Information System	CERCLIS	USEPA
Engineering Controls Sites List	ENG CONTROLS	USEPA
Sites with Institutional Controls	INST CONTROL	USEPA
Resource and Conservation Recovery Act (RCRA) – Treatment, Storage and Disposal	RCRA-TSDF	USEPA
Superfund (CERCLA) Consent Decrees	CONSENT	USEPA
Land Use Control Information System	LUCIS	USEPA
CERCLA Lien Information	LIENS 2	USEPA
National Priority List	NPL	USEPA
Manufactured Gas Plants	EDR MGP	IEPA
Solid Waste Landfill Inventory	IL_NIPC	IEPA
Institutional Controls	INST CONTROL	IEPA
Sites with Engineering Controls	ENG CONTROLS	IEPA

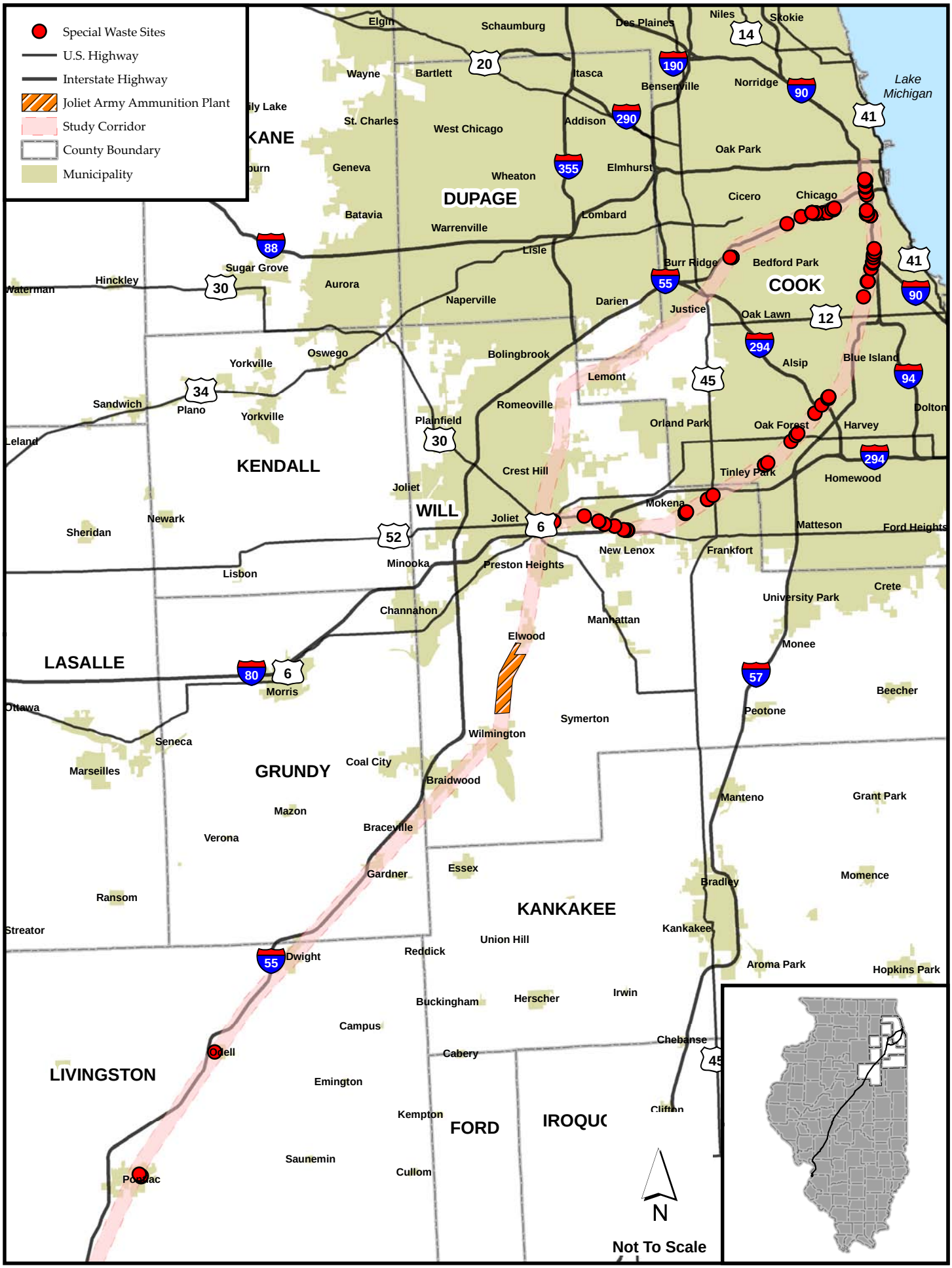


Exhibit 4.14-1. Special Waste (1 of 3)

Exhibit 4.14-2. Special Waste (2 of 3)

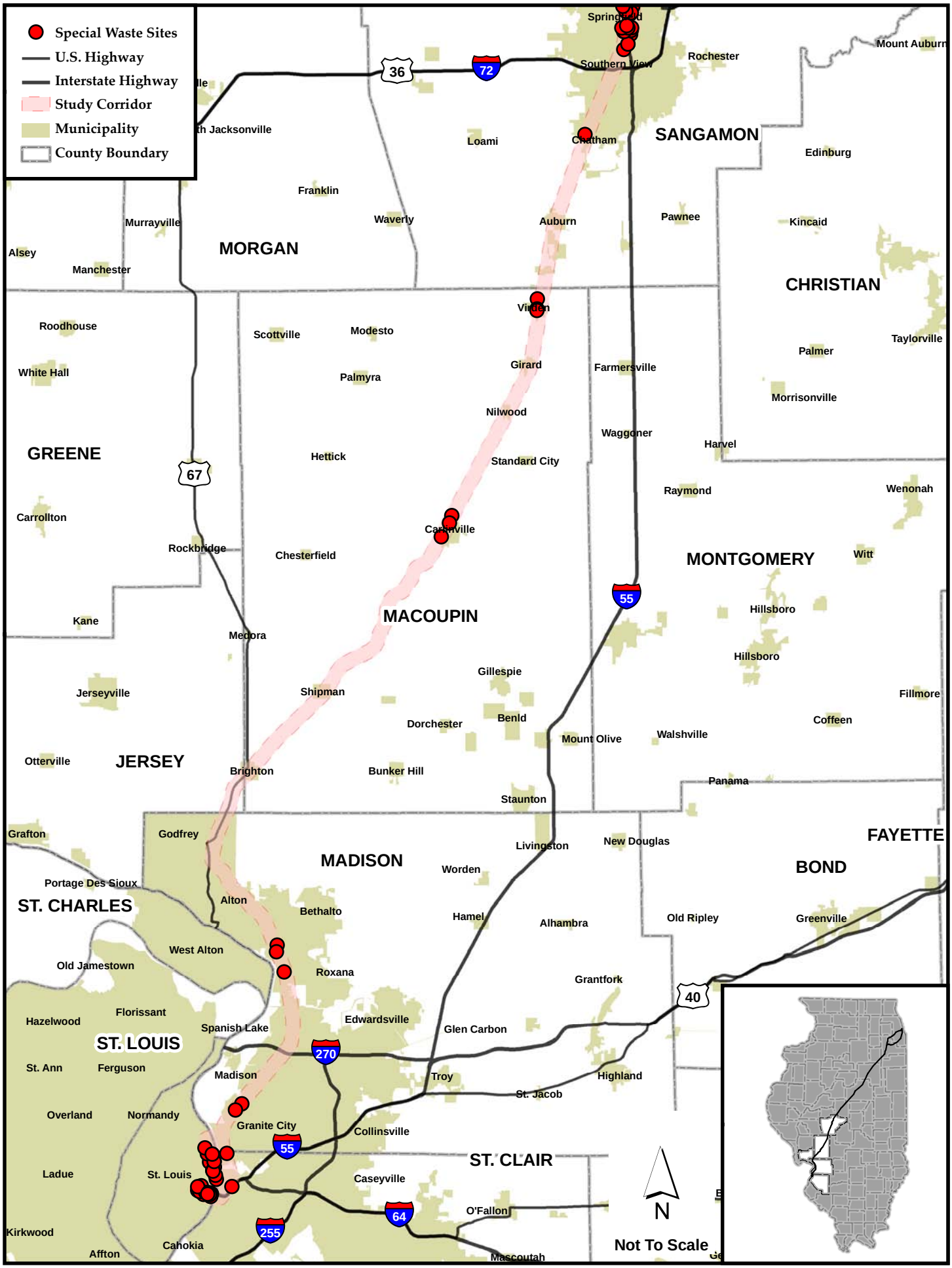


Exhibit 4.14-3. Special Waste (3 of 3)

Of particular interest are Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) sites and National Priority List (NPL) sites. The NPL is a subset of CERCLIS and identifies sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. CERCLIS contains data on potentially hazardous waste sites that are either proposed or included on the NPL and sites which are in the screening and assessment phase for possible inclusion on the NPL. There are six NPL sites and 41 additional CERCLIS sites identified in the records. The six NPL sites are listed in Table 4.14-2.

Table 4.14-2. NPL Sites

Site	Location
Joliet Army Ammunition Plant (Manufacturing Area)	Joliet, IL
Joliet Army Ammunition Plant (Load-Assembly-Packing Area)	Joliet, IL
Metalico-Granit City, Inc.	Granite City, IL
Jennison-Wright Corporation	Granite City, IL
Chemetco, Inc.	Hartford, IL
Lenz Oil Service, Inc.	Lemont, IL

The Joliet Ammunition Plant NPL sites are very large areas that occupy both the east and west sides of the study corridor and several miles of the study corridor itself. In addition to the six NPL sites listed in Table 4.14-2, Appendix D also lists the 41 CERCLIS sites and all other potential special waste sites identified within the study corridor.

4.15 Section 4(f)/6(f) and Parklands

This section identifies parks, wildlife refuges, nature preserves, and other lands adjacent to the rail corridor that may qualify for protection under Section 4(f) of the Department of Transportation Act of 1966 or Section 6(f) of the Land and Water Conservation Fund (LWCF) Act of 1965. Historic sites, which are also protected under Section 4(f), are discussed in Section 4.5 Cultural Resources.

Section 4(f) stipulates that FRA and other DOT agencies cannot approve the use of land from publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites unless the following conditions apply:

- There is no feasible and prudent alternative to the use of land.
- The action includes all possible planning to minimize harm to the property resulting from use.

There are three different scenarios in which a Section 4(f) use of a property occurs: (1) when the land is permanently taken to allow for a transportation facility, (2) when a temporary occupancy occurs in order to allow for construction-related activities, or (3) when there is an indirect impact. Public school properties are typically not classified as Section 4(f), unless their facilities support an organized public recreational activity such as youth soccer or serve a community recreational purpose (e.g., a playground that serves a neighborhood recreational need after school hours). Public school properties

are discussed in Section 4.2.4; potential Section 4(f) consideration for these facilities will be evaluated during Tier 2 studies.

The LWCF was enacted to establish a funding source to assist states and Federal agencies in meeting present and future outdoor recreation demands and needs. Section 6(f) of the Act requires that all properties "acquired or developed, either partially or wholly, with LWCF funds" must be maintained as such in perpetuity. Section 6(f)(3) states that those properties acquired or developed with LWCF funds shall not be converted to a use other than public outdoor recreation without the approval of the Secretary of the Department of the Interior, acting through the National Park Service and at the request of the state delegate/State Liaison Officer.

An inventory of properties located within 250 feet of the existing railroad alignments that may qualify for protection under Section 4(f) was conducted. Fifty-two sites with potential Section 4(f) recreational or refuge resources were identified and are shown in Table 4.15-1 and Exhibit 4.15-1. Historic sites within the study corridor are identified and discussed in Section 4.5.

Table 4.15-1. Potential Section 4(f) Properties within 250 Feet of Alignments

Resource	County	Section
Hoyne Park	Cook	1
Leclaire-Hearst Community Park	Cook	1
Stars and Stripes Park	Cook	1
Hanover Park	Cook	1
Summit Park	Cook	1
Unnamed Park (Vana St, Willow Springs, IL)	Cook	1
Lions Park	Cook	1
Red Gate Woods/Columbia Woods (Cook County Forest Preserve)	Cook	1
Long Run Seep Nature Preserve	Will	1
Lockport Golf & Recreation	Will	1
Dellwood Park	Will	1
Centennial and I&M Canal Trail System	Will	1
Ping Tom Memorial Park	Cook	1, 2
Metcalfe Park	Cook	2
Taylor Park	Cook	2
Park No. 527 (S La Salle St & E 63rd)	Cook	2
Hamilton Park	Cook	2
Lyle Park	Cook	2
Auburn Park	Cook	2
Troublemakers Park	Cook	2

Table 4.15-1. Potential Section 4(f) Properties within 250 Feet of Alignments (continued)

Resource	County	Section
Memorial Park (Midlothian)	Cook	2
Midlothian Meadows	Cook	2
Vogt Woods Park	Cook	2
George W. Dunne National Golf Course	Cook	2
Lancaster Woods Park	Cook	2
Unnamed Park (at Western Ave Bridge over Cal-Sag Channel)	Cook	2
St. Mihiel Reservation (CC Forest Preserve)	Cook	2
Sanctuary Golf Club	Will	2
Hickory Creek Forest Preserve	Will	2
R S Corcoran Park/Haines Wayside Park	Will	2
Potawatomi Woods County Forest Preserve	Will	2
Pilcher Park	Will	2
Highland Park	Will	2
Midewin National Tallgrass Prairie	Will	3
Des Plaines Fish & Wildlife Area	Will	3
Hitts Siding Prairie Nature Preserve	Will	3
Manzonia-Braidwood State Fish & Wildlife Area	Will	3
Florence W. Garrett Park	Livingston	3
Keller Park	McLean	3
Funks Grove Land and Water Reserve/ Funks Grove Nature Preserve/ Stubblefield Woodlots Nature Preserve	McLean	3
Edward R Madigan State Park/ Railsplitter State Park	Logan	3
Unnamed Park (Sherman)	Sangamon	3
Memorial Pool Park	Sangamon	4, 5
Iles Park	Sangamon	5
Interurban Trail (Chatham to Springfield)	Sangamon	6
Veterans Park	Sangamon	6
Sangamon Valley Greenway	Sangamon	6
Beaver Dam State Park	Macoupin	6
Denby Prairie Nature Preserve	Macoupin	6
Hartford Park	Madison	6
Wadlow (Alton) Municipal Golf Course	Madison	6
Lee Park	Madison	7
Malcolm Martin Memorial Park	St. Clair	7

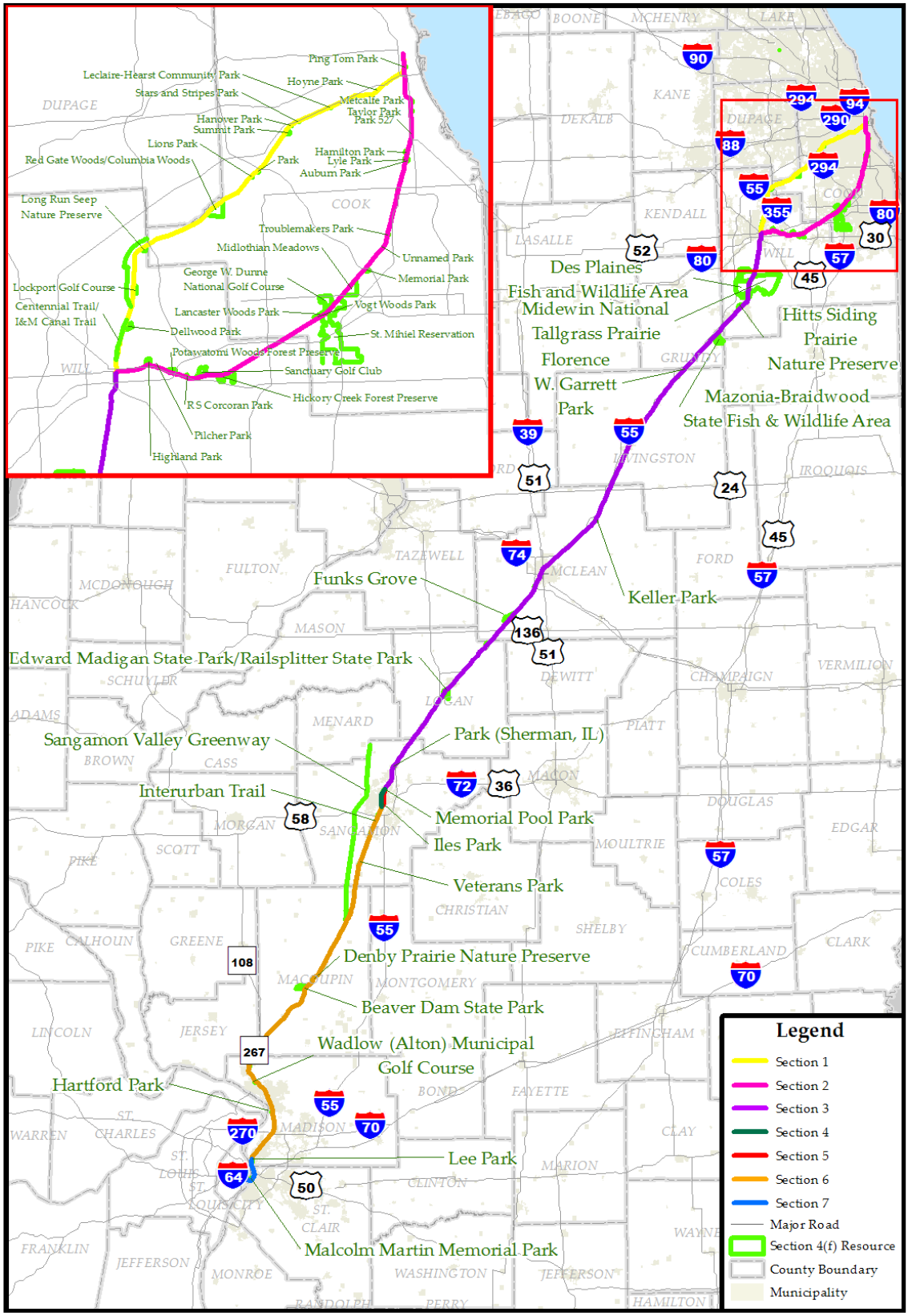


Exhibit 4.15-1. Section 4(f) Resources

Two recreation sites, listed in Table 4.15-2, were identified on the National Park Service list of sites receiving LWCF grants and are, therefore, potentially eligible for protection under Section 6(f). The Beaver Dam State Park grant was used to fund improvements to a Sanitary Dump Station. Based on information provided by Illinois Department of Natural Resources, the area of improvements is located west of Beaver Dam Lake, approximately one mile from the study corridor. The I&M Canal Trail grant was used to improve a 2.0 mile segment of the trail in Lockport, from 2nd Street to Dellwood Park. Portions of the trail are located within the study corridor.

Table 4.15-2. Potential Section 6(f) Properties within 250 Feet of Alignments

Resource	County	Section	Grant Type	Grant Amount	Grant Date
I&M Canal Trail System	Will	1	Development	$256,490.26	1982
Beaver Dam State Park	Macoupin	6	Redevelopment	$9,683.70	1983

4.16 Safety and Security

The Federal Railroad Administration (FRA) has primary authority over railroad safety. FRA's regulations govern aspects of railroad safety, including rail operations, track, and signaling, as well as rolling stock, such as locomotives and freight cars (49 CFR 200-299). The states also have an important role in freight rail safety, especially at highway/rail at-grade crossings. Other groups that establish standards and practices for the industry include the Association of American Railroads (AAR), the American Short Line and Regional Railroad Association (ASLRRA), and the American Railway Engineering and Maintenance-of-Way Association (AREMA).

4.16.1 Rail Operations Safety and Security

4.16.1.1 Train Operations

FRA's Track Safety Standards (49 CFR Part 213) are based on classifications of track that determine maximum operating speed limits, inspection frequencies, and standards of maintenance, among other issues. Higher track classes require more stringent maintenance standards to support higher allowable maximum operating speed. The existing passenger service is designated Class 4, allowing maximum speeds up to 79 mph. Existing maintenance and inspection requirements, as documented in the existing service plan, meet FRA Class 4 standards.

In the current security climate, rail line security continues to be a prominent concern. Access points are of particular concern. The entire study corridor is accessible from many miles of arterial and secondary roadways where no security measures are practicable. Standard rail security practices are in place in at all rail yards throughout the study corridor.

4.16.1.2 Passenger Areas

Passengers interact with the rail system at stations, on platforms, and within passenger trains. These facilities are susceptible to a range of safety and security threats ranging from personal accidents (e.g., slips or trips) to criminal activity (e.g., theft or terrorism to Passenger Areas). Platform areas add risks associated with moving trains and train boarding. Finally, once on the train, passengers are at risk for these same incidents.

Amtrak has previously reviewed each of the 11 stations in the study corridor to ensure that appropriate safety measures, tailored to the specific setting, are in place. Each station and train includes a set of security infrastructure to deter or respond to safety or security incidents that may include:

- Lighting;
- Fire/life safety systems;
- Video cameras; and
- Public address systems.

Amtrak, along with the Amtrak Police Department, has a range of behind-the-scenes and front-line security measures in place to ensure passenger rail security. Among these security measures, some of which are conducted on an unpredictable or random basis, passengers may notice any of the following in stations or onboard trains:

- Uniformed police officers and Special Operations Units;
- Random passenger and carry-on baggage screening and inspection;
- K-9 units;
- Checked baggage screening;
- Onboard security checks; and
- Identification checks.

These measures are customized to each setting based on reviews of potential incidents and occurrence risk.

4.16.1.3 Yard/Service Areas

Amtrak currently operates yard and maintenance facilities in the Chicago area to support the existing passenger service in the study corridor. These facilities are operated in accordance with FRA standards for safety and security.

4.16.2 Crossing Safety

4.16.2.1 Rail-Rail Crossings

The existing alignment utilized for passenger service from Chicago to St. Louis includes 33 locations where it crosses another rail line. Fourteen of these crossings are at-grade. The movement of rail traffic through these intersections, called interlockings, is governed similarly to a highway intersection. Traffic signals show a green light in one

direction and a red light in another direction to eliminate conflicting movements. Railroad interlockings differ slightly in that priority can be assigned by the interlocking controller. In other words, the controlling railroad determines which train goes first. Table 4.16-1 provides a list of these crossings, from north-to-south, in the study corridor.

Table 4.16-1. At-Grade Rail-Rail Crossings

Section	Milepost	HSR Alignment Railroad	Crossing Railroad	Controls Interlocking
1	5.10	CN	Norfolk Southern (NS)/CSX	NS
1	6.60	CN	BNSF Railroad	CN
1	7.90	CN	Chicago Belt Railroad	Chicago Belt Railroad
1	13.20	CN	Indiana Harbor Belt Railroad	Indiana Harbor Belt
2	6.68	NIRC	Norfolk Southern	NIRC
2	38.96	NIRC	Elgin, Joliet & Eastern Railroad	NIRC
2	37.53	UP	NIRC	NIRC
3	37.53	UP	NIRC	NIRC
3	72.81	UP	Norfolk Southern	UP
3	102.29	UP	Toledo Peoria and Western Railroad	UP
3	126.52	UP	Norfolk Southern	UP
3	155.68	UP	CN	UP
6	210.54	UP	BNSF Railroad	UP
7	280.73	UP	CSX	UP

A dispatcher controls the movement of both passenger trains and freight trains on the same track or tracks. Redundant safeguards are in place to avoid conflicting movements that could result in a collision. Nevertheless, the risk does exist for accidents to occur that could impact the safety of passengers aboard trains or train crews. Potential risks include two types of accidents: either a collision of two trains on the same track, or a derailed train on one track being struck by a moving train on the adjacent track. All such accidents are reported to FRA, who has jurisdiction over safety and maintains a database of such accidents.

4.16.2.2 Highway-Rail and Pedestrian-Rail Crossings

Where a roadway, sidewalk or pedestrian trail/bikeway crosses the track at the same elevation, this is called a "grade" crossing. Where a roadway, sidewalk or pedestrian trail/bikeway passes over the tracks via an "overpass" bridge structure or passes under a

railroad track via an underpass bridge structure, these crossings are referred to as "grade separated."

FHWA and FRA have regulatory jurisdiction over safety at crossings, pursuant to the Highway Safety Act of 1966 (HSA) (23 USC 401 et seq.). The HSA governs the distribution of federal funds to states aimed at eliminating hazards at highway-rail grade crossings. USDOT has issued regulations that address crossing safety and provides federal funding for the installation and improvement of warning devices through state departments of transportation. In addition to federal oversight and funding, states also monitor crossings and, in many cases designate funding to complement the federal funds.

Jurisdiction over highway-rail grade crossings falls primarily to the states. This authority is set forth in the Railroad-Highway Grade Crossing Handbook (FHWA 2007a). Each state department of transportation is required to periodically inspect highway-rail grade crossings and to determine the adequacy of warning devices at each location, as well as to order safety improvements. USDOT oversees and approves the state determinations.

In Illinois, the Illinois Commerce Commission (ICC) has regulatory jurisdiction over safety at all public crossings (625 ILCS 5/18c-7401). No public road, highway, street, sidewalk or pedestrian trail/bikeway shall be constructed across the track of any rail carrier at grade, nor shall the track of any rail carrier be constructed across a public road, highway, street, sidewalk or pedestrian trail/bikeway at grade, without permission of the ICC.

The ICC also has the power to require the separation of grades at any proposed crossing where a public road, highway, street, sidewalk or pedestrian trail/bikeway may cross the tracks of a rail carrier.

All warning signs or automatic warning devices installed at public crossings in Illinois must meet the minimum requirements of 92 Illinois Administrative Code 1535. In addition, all warning signs or warning devices installed at crossings must comply with FHWA's Manual on Uniform Traffic Control Devices (MUTCD) (23 CFR 646.214[b][1[). The MUTCD provides standards for the types of warning devices that must be installed at all highway-rail grade crossings (FHWA 2007b). FRA issued regulations under its railroad safety authority that impose minimum standards for highway-rail grade crossings (49 CFR Part 234). FRA maintains information for each highway-rail grade crossing based on information provided by the states and the railroads. FRA and FHWA coordinate research efforts related to highway-rail grade crossing collisions and provide guidance and solutions to problems.

Table 4.16-2 provides a summary of the number and type of crossings along the study corridor.

Table 4.16-2. Summary of Highway-Rail Crossings

Section	At-Grade Crossings				Grade Separated Crossings				
	Public	Private	Ped	Subtotal	Public	Private	Ped	Subtotal	Total
1	31	16	1	48	52	5	0	57	105
2	45	6	1	52	78	1	1	80	132
3	106	23	4	133	31	2	1	34	167
4	30	0	0	30	0	0	0	0	30
5	22	0	0	22	0	0	0	22	22
6	60	23	2	85	15	1	0	16	101
7	3	0	0	3	16	0	0	16	19

Appendix E provides a list of all crossings in the study corridor and the safety measures currently in place at each.

4.16.2.3 Emergency Access during Grade Crossing Closures or Blockages

The existing study corridor passes through dozens of jurisdictions, including local, county, and park properties, each with one or more providers of emergency services (e.g., police, fire, ambulance, etc.). Each of these jurisdictions is responsible for coordinating with the railroad owner and developing their own plan for addressing issues associated with unplanned grade crossing closures or blockages. No information is available regarding how many emergency service providers have developed such plans.