Spire STL Pipeline Project

Draft Resource Report 3
Fish, Wildlife, and Vegetation

FERC Docket No. PF16-9-000

Pre-filing draft
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Public

RESOURCE REPORT 3 - FISH, WILDLIFE, AND VEGETATION	
SUMMARY OF FILING INFORMATION	
Information	**Found in**
1. Classify the fishery type of each surface waterbody that would be crossed, including fisheries of special concern - Title 18 Code of Federal Regulations (CFR) part (§) 380.12(e)(1)	Section 3.1.1, Table 3.1-1, and Section 3.1.2
2. Describe terrestrial and wetland wildlife and habitats that would be affected by the project - 18 CFR § 380.12(e)(2)	Section 3.2.2
3. Describe the major vegetative cover types that would be crossed and provide the acreage of each vegetative cover type that would be affected by construction - 18 CFR § 380.12(e)(3)	Section 3.3, Table 3.3-1
4. Describe the effects of construction and operation procedures on the fishery resources and proposed mitigation measures - 18 CFR § 380.12(e)(4)	Section 3.1.3
5. Evaluate the potential for short-term, long-term, and permanent impact on the wildlife resources and state-listed endangered or threatened species caused by construction and operation of the project and proposed mitigation measures - 18 CFR § 380.12(e)(4)	Section 3.2.2
6. Identify all federally listed or proposed endangered or threatened species that potentially occur in the vicinity of the project and discuss the results of the consultations with other agencies. Include survey reports as specified in 18 CFR § 380.12(e)(5)	Section 3.4.1
7. Identify all federally listed essential fish habitat that potentially occurs in the vicinity of the project and the results of abbreviated consultations with the National Oceanic and Atmospheric Administration's National Marine Fisheries Service, and any resulting essential fish habitat assessment - 18 CFR § 380.12(e)(6)	Section 3.1.2

RESOURCE REPORT 3 - FISH, WILDLIFE, AND VEGETATION	
SUMMARY OF FILING INFORMATION	
Information	**Found in**
8. Describe any significant biological resources that would be affected. Describe impact and any mitigation proposed to avoid or minimize that impact - 18 CFR § 380.12(e)(4,7)	Section 3.4.2
INFORMATION RECOMMENDED OR OFTEN MISSING	
1. Provide copies of correspondence from federal and state fish and wildlife agencies along with responses to their recommendations to avoid or minimize impacts on wildlife, fisheries, and vegetation.	Appendices 3-A and 3-B
2. Provide a list of significant wildlife habitats crossed by the project. Specify locations by milepost, and include length and width of crossing at each significant wildlife habitat.	Table 3.2-1
3. Provide a description of project-specific measures that would be implemented during construction and operation of the project to avoid or minimize impacts on migratory birds. Include comments from the U.S. Fish and Wildlife Service on the proposed measures.	Table 3.2-2 and Appendix 3-B
4. For offshore species be sure to include effects of sedimentation, changes to substrate, effects of blasting, etc. This information is needed on a location-specific (i.e., milepost) basis and may require completion of geophysical and other surveys. Results of such surveys and analyses should be included in the application.	Not Applicable

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Tables

Appendices

Acronyms and Abbreviations

ATWS	Additional Temporary Workspaces
BGEPA	Bald and Golden Eagle Protection Act
CFR	Code of Federal Regulations
EFH	essential fish habitat
Enable MRT	Enable Mississippi River Transmission, LLC
FERC	Federal Energy Regulatory Commission
E&S	erosion and sediment
HDD	horizontal directional drill
IDNR	Illinois Department of Natural Resources
IPaC System	Information, Planning and Consultation System
MDOC	Missouri Department of Conservation
MP	milepost
NMFS	National Marine Fisheries Service
Plan	FERC's Upland Erosion Control, Revegetation, and Maintenance Plan
Procedures	FERC's Wetland and Waterbody Construction and Mitigation Procedures
Project	Spire STL Pipeline Project
REX	Rockies Express Pipeline LLC
RTE species	rare, threatened, or endangered species
Spire	Spire STL Pipeline LLC
TWS	temporary workspace
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
WWF	Warmwater fisheries

Fish, Wildlife, and Vegetation

Resource Report 3 presents a description of the fish, wildlife, and vegetation resources present within Spire STL Pipeline LLC's ("Spire's"), proposed Spire STL Pipeline Project ("Project") located in Scott, Greene, and Jersey Counties, Illinois; and St. Charles and St. Louis Counties, Missouri. The report identifies potential impacts on these resources and methods to avoid and/or minimize potential adverse impacts.

3.1 Fisheries and Other Aquatic Resources

3.1.1 Fishery Classification

Fishery classifications for streams crossed by the Project, are included in Resource Report 2 along with other data concerning specific stream crossings. See Table 3.1-1 for a description of the representative fish species likely to occur within the Project area.

As described in Resource Report 2, environmental field surveys on the Project began in September 2016 and are ongoing. Spire has included the field data through September 23, 2016, and has supplemented with desktop data where surveys have not yet been completed. The Project is anticipated to cross 68 waterbodies, including 19 perennial, 33 intermittent, and 16 ephemeral. Where the environmental field survey is incomplete, a review of the National Hydrography Dataset, maintained by the United States Geological Survey, was completed for the Project area.

All waterbodies crossed by the Project are designated as warmwater fisheries ("WWF") in Illinois and in Missouri. No known wild trout streams, high quality waters, waterbodies listed as outstanding or exceptional quality, or state or federal wilds and scenic rivers occur within the Project area (IEPA, 2016; MDNR, 2016; MDNR, 2014; USFWS, 2016a). The Project will cross several Section 303(d) waters, including; Apple Creek, Macoupin Creek, and the Mississippi River in, Illinois and the Mississippi River and, Missouri River in Missouri along the 24-inch pipeline, and Coldwater Creek in Missouri along Line 880.

State designated areas to fish within the Project area and vicinity include the Mississippi River, Missouri River, and Spanish Lake in Missouri. Common sport fish species that occur within the states regulated fishing areas are included in Table 3.1-1. The classification information with the corresponding milepost ("MP") per stream crossed by each facility is included on the surface water table in Table 2.2-1 in Resource Report 2.

The Project is proposing to cross the Mississippi River and Missouri River via horizontal directional drill ("HDD").

3.1.2 Fisheries of Special Concern

Fisheries of special concern are defined as waterbodies given special designation by state environmental regulatory agencies as important commercial or recreational fisheries or otherwise protected fishery areas. Based on the National Marine Fisheries Service's ("NMFS") online essential fish habitat ("EFH") mapper tool, there is no

EFH within the Project area (NMFS, 2016). There are no national Wild and Scenic Rivers within the Project area (USFWS, 2016a).

Table 3.1-1. Representative Fish Species in Waterbodies Crossed by the Project

Common Name	Scientific Name	Type
Illinois		
Bluegill	*Lepomis macrochirus*	Freshwater
Channel catfish	*Ictalurus punctatus*	Freshwater
Black crappie	*Pomoxis nigromaculatus*	Freshwater
Lake Sturgeon	*Acipenser fluvescens*	Missouri State-Listed Endangered Species; Freshwater[1]
Pallid Sturgeon	*Scaphirhynchus albus*	Federally-Listed Endangered Species; Freshwater[2]
Paddle fish	*Polyodon spathula*	Freshwater
Freshwater drum	*Aplodinotus grunniens*	Freshwater
Missouri		
Paddle fish	*Polyodon spathula*	Freshwater
Lake Sturgeon	*Acipenser fluvescens*	Missouri State-Listed Endangered Species; Freshwater[1]
Pallid Sturgeon	*Scaphirhynchus albus*	Federally-Listed Endangered Species; Freshwater[2]
Carp species	*Mylopharyngodon* spp.	Freshwater
Freshwater drum	*Aplodinotus grunniens*	Freshwater
Shovelnose sturgeon	*Scaphirhynchus platorynchus*	Freshwater
Perch species	*Sander* spp.	Freshwater
Catfish species	*Ictalurus* spp.	Freshwater
Largemouth Bass	*Micropterous salmoides*	Freshwater
Black Crappie	*Pomoxis nigromaculatus*	Freshwater
Bluegill	*Lepomis macrochirus*	Freshwater

Notes:

[1] Missouri Department of Conservation ("MDOC"). 2016c. *Missouri Fishing Interactive Map*.

[2] Illinois Department of Natural Resources ("IDNR"). 2016a. *Lake and River Fishing in Illinois*.

According to the United States Fish and Wildlife Service ("USFWS") Information, Planning and Consultation ("IPaC") System, the Project is within the ranges of federally endangered Higgins Eye Clam (*Lampsilis higginsii*) freshwater mussels and pallid sturgeons (*Scaphirhynchus albus*). The Higgins Eye Clam is an inhabitant of larger

rivers where it is usually found in areas with deep water and moderate currents. It can be found locally in the upper Mississippi River (USFWS, 2013). According to the USFWS's Environmental Conservation Online System ("ECOS"), Higgins Eye Clam is not known to or believed to occur within the immediate Project area, but is located approximately 35-miles upstream of the Project area (USFWS, 2013). Pallid sturgeon are a bottom-oriented, large river obligate fish inhabiting the Missouri and Mississippi rivers and some tributaries. According to ECOS, pallid sturgeons are known to or believed to occur within the 24-inch pipeline crossing of the Mississippi and Missouri Rivers (USFWS, 2016b and 2016c).

No aquatic species were identified by the Illinois Natural Heritage Program data but consultations are ongoing and will be provided in the FERC application. Copies of correspondence are included in Resource Report 1, Appendix 1-C.

The MDOC's Preliminary Natural Heritage Review Report identified several species and communities of concern that may be crossed, or are within close vicinity to the Project, including pallid sturgeon, Lake Sturgeon, Flathead chubs, and mussel species. Consultation with the MDOC regarding these state listed species is ongoing and will be provided in the FERC application (MDOC, 2016b). Copies of correspondence are included in Resource Report 1, Appendix 1-C.

No streams crossed by the Project are listed on the Missouri 10CSR20.7 Water Quality Standards Table C - Waters Designated for Cold-Water Fisheries (MDNR, 2014). Streams listed on the Missouri combined stream spawning season list includes stream reaches which support resident species [e.g., rare, threatened, or endangered ("RTE") species or other sensitive species, rainbow trout, rock bass, smallmouth bass, suckers, etc.], or species that migrate into a reach seasonally to spawn (e.g., walleye, white bass, etc.). No streams crossed by the Project within St. Charles or St. Louis County are present on the spawning list and no streams crossed by the Project are designated within the one-mile buffer receiving waters for the listed streams (USACE, 2012).

The Laclede/Lange Delivery Station, Redman Delivery Station, Enable Mississippi River Transmission, LLC ("Enable MRT") Bi-directional Station, and contractor yards have been cited in upland areas and are not anticipated to impact fisheries of special concern, however stream and wetland investigations are ongoing at these sites. Additional updates will be provided in the FERC application. Table 3.1-2 details the fisheries of special concern in the Project area.

Table 3.1-2. Fisheries of Special Concern in the Vicinity of the Project

Facility/Waterbody Name	MP	County	State	Fishery Concern
24-Inch Pipeline				
Mississippi River	44.6	Jersey	Illinois	Contains federally-listed and state-listed threatened and endangered species, also is a state fish and wildlife designated area.
Missouri River	57.1	St. Charles	Missouri	RTE Species

3.1.3 Construction and Operation Impacts

The Project will employ specific construction techniques in the Project workspaces, to avoid and/or minimize the effects of construction on habitats in and along the streams and downstream of crossing locations. Waterbody crossing methodology is identified and discussed in Resource Report 2. These crossings include conventional open-cut techniques, dry ditch crossing methods (dam and pump, flume techniques), and HDD techniques. Minor waterbodies with no discernible flow at the time of construction may be crossed using the conventional trenching method (i.e., bed and bank disturbance with no stream flow bypass equipment installed). For conventional trench crossings, the pipeline will be placed deep enough to meet the minimum cover requirement of five feet, provided no rock is encountered.

Crossing the streams via dry ditch methods will temporarily affect water flow and quality. In general, construction activities will disturb streambeds and banks as well as increase erosion and sediment ("E&S") potentials. Increased sedimentation and the disruption of water flow may increase turbidity levels within the stream. Inadvertent release of equipment-related fluids may also have an impact on water quality. In addition, alteration of stream banks and removal of riparian vegetation may affect bank stability resulting in deposition of eroded soils downstream.

Riparian vegetation contributes to the shading of rivers and their tributaries. It is a factor in the amount of solar radiation that reaches the water surface, which, in turn, controls the input of heat into the stream system. Installing pipelines near or across waterways, would necessitate the removal of some of the riparian growth. Once this vegetation is removed, the water may be subject to full sunlight exposure, which could cause increases to stream temperature.

Although HDD methods generally avoid impacts on water quality by avoiding impact to the stream bank and bottom, a potential for an inadvertent return of drilling mud may occur. The release could result in additional sediment deposition extending from the discharge point downstream. In the event of an inadvertent release of drilling mud, impacts on fish and other aquatic resources would be similar to those for the open cut construction method discussed above.

To avoid and minimize the effects on aquatic organisms and their habitats, Spire will construct the pipeline in accordance with the Federal Energy Regulatory Commission's ("FERC's") *Upland Erosion Control, Revegetation, and Maintenance Plan* ("Plan") and *Wetland and Waterbody Construction and Mitigation Procedures* ("Procedures") as well as other federal and state requirements identified during the permitting process. These measures will include:

- requiring temporary E&S control measures installed and maintained along the construction right-of-way;
- maintaining appropriate water flow downstream of the crossing;
- requiring construction to be completed within specified hourly time frames based on size of crossing;
- routinely inspecting construction equipment for leaks and storing fuel and hazardous materials in upland areas at least 100 feet from waterbodies;

- responding quickly to leaks and spills by implementing measured outlined in the Project's Spill Prevention Control and Countermeasure Plan (Resource Report 2, Appendix 2-A); and
- implementing the HDD Contingency Plan related to inadvertent returns; the plan would include a protocol for contacting all appropriate agencies as well as methodology on reducing the pressure of the drill or stopping the drill so the leak would stop. The plan will also include a protocol for containing and cleaning up the spill.

Based on the review of the available data from the USFWS ECOS tool, Spire anticipates that Higgins Eye Clams and Pallid sturgeons are restricted to the Mississippi River and Missouri Rivers. Spire is proposing to cross these rivers via HDD, therefore no in-stream construction or disturbance to the stream bed is anticipated at these locations. It is anticipated that an HDD of these waterbodies would avoid potential effects of the Project on these species, therefore Spire has determined that the Project is not likely to adversely affect these species.

Per the USACE Nationwide Permit for Missouri, the permittee must not excavate from or discharge into the listed waters on the Missouri Combined Stream Spawning List during the specified seasonal restrictions. No streams crossed by the Project within St. Charles or St. Louis Counties, Missouri, are listed on the spawning list and no streams crossed by the Project are designated within the one mile buffer receiving waters for the listed streams (USACE, 2012). At this time, the IEPA (Twait, 2016) and MDNR have indicated they do not have instream construction timing restrictions for WWF. Timing restrictions that differ from the FERC Procedures developed in consultation with the applicable state agencies is allowed under Section V of the FERC Procedures. Therefore, Spire anticipates that construction can occur at any time of year on the waterbodies crossed by the Project.

Once construction is complete, streambeds and banks will be restored to their re-construction conditions and contours to the maximum extent practicable, which will aid in preventing erosion and minimizing long term impacts on fisheries. Operation of the pipeline facilities is not anticipated to impact aquatic organisms and their habitats.

Spire will complete a HDD for the Project under potential fish habitat in the Mississippi River. The HDD will include entry/exit pits located north and south of the Mississippi River. Spire will also complete a HDD crossing under the Missouri River, however no fishery habitat of special concern was designated by the IPaC System at this crossing. The crossing will include entry/exit pits north and south of the Missouri River.

The use of HDD's to cross these rivers will minimize impacts on fishery resources as direct sediment impacts will be avoided. The primary impact that could occur is an inadvertent release of drilling mud (inadvertent return) directly or indirectly into the stream/rivers. Drilling mud may leak through previously unidentified fractures in the material underlying the riverbed; in the area of the mud pits or tanks or along the path of the drill, due to unfavorable ground conditions. Although drilling mud consists of naturally occurring nontoxic material, such as bentonite clay and water, in larger quantities the release of drilling mud into a waterbody could affect fisheries or other aquatic organisms by settling and inundating the habitats used by these species.

Spire will minimize the potential for the inadvertent release of drilling mud by implementing its HDD Contingency Plan which will be included in Resource Report 2, Appendix 2-B in the FERC applicable. Spire will also ensure the contractor has sufficient spill containment material and supplies as needed to contain any inadvertent returns.

These may include, but are not limited to, pumps and hoses, sand bags, straw bales, silt fence and turbidity curtain. Upon discovery of an inadvertent return, the HDD operation will be immediately suspended until the contingency plan is implemented. Spire will report any releases along the waterbody banks or within live water to the state emergency response centers and resource agencies.

Prior to placing the Project into service, the pipeline segments and aboveground facilities will be hydrostatically tested. Spire has not yet finalized water sources for hydrostatic testing, however it is anticipated that municipal sources will be utilized.

Refueling and lubricating of vehicles and/or equipment will occur no closer than 100 feet from a waterbody unless no feasible alternative exists or a greater setback is stipulated by a permitting agency. Spire will also locate additional temporary workspaces ("ATWS") a minimum of 50 feet from waterbody and wetland boundaries unless a reduced setback is requested on a site-specific basis and a modification is approved in accordance with FERC's Procedures. Proposed exceptions to FERC's Plan and Procedures is provided in Resource Report 1, Appendix 1-F. The Project, as proposed, will result in minimal impacts on fisheries and special status fish species due to the use of the HDD method for crossing the Mississippi River and the Missouri River, the use of FERC's Plan and Procedures, and adherence to all permit conditions.

3.2 Wildlife

Vegetation that typifies major natural habitat types is described in Section 3.3. The existing wildlife resources affected by the Project include resources identified along the 24-inch pipeline construction workspace, the Line 880 workspaces, ATWS, aboveground facilities, access roads, and contractor yards.

Game and nongame-wildlife species are regulated and protected by state and federal agencies such as the USFWS, the IDNR and the MDOC. Regulations such as the Endangered Species Act of 1973, the USFWS Conservation Act of 1980 and the USFWS Conservation Act of 1958 also regulate protected plant and animal species of concern. Additional information on federal and state threatened species can be found in Section 3.4.

The Project area and surrounding vicinity are a combination of upland and waterbody habitats common to the agricultural communities of western Illinois and residential communities surrounding St. Louis, Missouri. A review of pertinent literature and field observations was used to determine the spatial distribution, habitat requirements, and ecological status of wildlife species observed or known to occur in the Project vicinity. The setting and anticipated effects on terrestrial wildlife are described in Sections 3.2.1 and 3.2.2.

3.2.1 Existing Resources

The Project crosses a variety of habitat types commonly found in rural, agricultural, and forested areas of western Illinois and eastern Missouri; the primary land use within the Project area is agricultural land. Other dominant landforms crossed include wooded areas and riverine habitat. Based on correspondence with state and federal agencies, Portage Island in the Mississippi River, which is located approximately one river mile downstream from the proposed HDD crossing, is a designated wildlife area managed by the USFWS. The IDNR has designated the upper Mississippi River as a state fish and wildlife area, while the MDOC designates the area for conservation. This area is primarily focused on wetland management, with waterfowl as the primary species of concern.

The wildlife species that inhabit the proposed Project area are typical of those found in the Great Plains habitat. Game species such as white-tailed deer, wild turkey, mourning doves and ring-necked pheasant are present. Resident and migratory waterfowl species (e.g., ducks and sandhill cranes) utilize the Missouri River and surrounding cropland for breeding and migration. Non-game species such as opossum, cottontail rabbits, various rodents, raccoons, coyotes, red fox and spotted skunk utilize the cropland and riverine habitat as den and foraging locations within the proposed Project area.

Dense grass, shrubs and small trees provide nesting habitat and seed production for a variety of songbirds such as warblers, finches and sparrows. Predatory birds such as red-tail hawks and northern harriers utilize upland meadows for hunting songbirds and small mammals (e.g., cottontail rabbits, voles and shrews). Bald eagles may utilize the Mississippi and Missouri River corridors for fishing and nesting. Several species of snakes, frogs and toads may also be found in general riverine habitat. Wildlife species observed during surveys include songbirds, ducks, western meadowlarks, cottontail rabbits, white-tailed deer, and red-tailed hawks.

Spire initiated consultation regarding the Project with the IDNR, MDOC, and USFWS in Illinois and Missouri on August 12, 2016. Information specific to federally-listed and state-listed species is provided in Section 3.4 of this resource report.

3.2.2 Construction and Operation Impacts

Pipeline and aboveground facility construction is expected to have minor, short-term impacts on wildlife habitat, causing localized effects on resident fauna. The Project will result in the loss of approximately 37.07 acres of forested habitat due to construction, with approximately 18.74 acres of forested habitat as a permanent loss due to maintenance/operation of the Project within the 50-foot permanent easement. Temporary work areas will be allowed to revegetate overtime and will not be maintained for the operation of the Project. See Section 3.3.2 for further discussion on forested habitat.

Clearing and grading of the proposed construction workspace for the 24-inch pipeline will result in the temporary loss of vegetative cover and may result in the loss of less mobile fauna, such as small rodents, reptiles, and invertebrates that may be unable to escape the construction area. Temporary noise from the HDD is anticipated for the duration of the drill, but will be mitigated by appropriate sound barriers and mufflers. It is anticipated that most wildlife can relocate to suitable adjacent habitat during construction. After construction, wildlife is expected

to return and use the post-construction habitats. Species diversity is expected to remain at or near pre-construction conditions following restoration of the pipeline workspace.

The 24-inch pipeline route was concentrated in areas of agricultural activity with forested cover being typically associated with riparian areas and property lines, therefore the permanent right-of-way in open areas (e.g., existing right-of-way and agricultural fields) generally will not result in significant fragmentation effects of forested areas. The impacts likely to occur from the construction and operation of the Project are temporal and not expected to be significant given the mobile nature of the wildlife that occur in the area, the availability of similar habitat adjacent to the Project area, and the compatible nature of the restored right-of-way with species occurring in the area. In addition, as the Line 880 modifications are primarily located within existing easement or maintained residential areas, no significant affects to wildlife are anticipated. It is expected that the construction of the Project will have short-term effects to wildlife species. No long-term wildlife impacts are anticipated, as plentiful and suitable wildlife habitat are present adjacent to the proposed Project area.

There are no significant or sensitive habitat areas, wildlife preserves, or areas of habitats designated for wildlife management within the Project area.

3.2.3 Unique and Sensitive Wildlife and Habitat

Consultations with the IDNR and MDOC are ongoing, however a preliminary review of their natural heritage program data identified the following significant wildlife habitat types that could potentially be crossed by the 24-inch pipeline and Line 880. Construction for Line 880, Redman Delivery Station, and the MRT Bi-directional Station will be primarily within exiting footprints and are not anticipated to disturb sensitive wildlife habitats. Table 3.2.1 details the sensitive wildlife habitat types affected by construction and operation of the Project.

Table 3.2-1. Significant Wildlife Habitat Types Affected by Construction and Operation of the Project

MP	Crossing Length (feet)	Crossing Width (feet)	Acreage Affected Construction	Acreage Affected Operation	Habitat Type/Name	Avoidance and Minimization Measures
24-Inch Pipeline						
Jersey County, Illinois	877	90-300	3.48	1.00	Principia Hills Prairies West Illinois Natural Area Inventory Site	Consultations with IDNR are ongoing regarding state ranked natural heritage areas.
45.1 – 45.6	2,557	50	3.42	2.94	Upper Mississippi Conservation Area	Project is not likely to adversely affect the area due to the HDD under the River
42.5 – 43.7	6,014	75-165	15.69	6.91	Karst Geologic Features	Agency consultations are ongoing regarding RTE bat species associated with karst features.

3.2.3.1 Principia Hills Prairies West Illinois Natural Area Inventory Site

The Principia Hill Prairie Natural Area, which is crossed by the 24-inch pipeline in Jersey County, Illinois supports a high quality loess hill natural community, a natural heritage landmark, and a population of Groundplum milkvetch (*Astragalus crassicarpus* var. *trichocalyx*), a state endangered species, which generally flowers April through May (Mohlenbrock, 2014). Loess hill prairies, are the most abundant type of prairie in Illinois and occur primarily along the Mississippi River and Illinois River. They are named for their characteristic wind-blown loam soil, which was deposited as the glaciers receded. Two subclasses of loess hill prairies can be recognized: one occurring on loess deposited above bluffs and the other where the loess is deposited just above the floodplains of rivers, mostly on top of mounds of glacial till. The Principia Hill Prairie supports native dry prairie species such as little bluestem, Indian grass, leadplant and purple prairie clover (Robertson et al., 1995). Consultations with the IDNR regarding the Principia Hills Prairies West Illinois Natural Area Inventory Site indicate that this site has no regulatory implications under Illinois law. Spire has located its proposed 24-inch pipeline route adjacent to an existing pipeline right-of-way through this area. Spire will coordinate with the IDNR and the landowner in this location to determine the appropriate minimization measures to be employed at this location. Further correspondence will be provided in the FERC application. Copies of correspondence are included in Resource Report 1, Appendix 1-C.

3.2.3.2 Upper Mississippi Conservation Area

The Upper Mississippi Conservation Area and is crossed by the 24-inch pipeline between MP 45.1 and MP 45.6. The area is rich in wildlife and habitat diversity and stretches from the Melvin Price Lock and Dam at Alton, Illinois, to LaGrange, Missouri. It is composed of 87 tracts of federal lands totaling over 11,000 acres and managed under a cooperative agreement between the USFWS, the United States Army Corps of Engineers (“USACE”) and the MDOC. This property is held in USACE fee title by the USACE St. Louis District. Crossing of this property will require a right-of-way easement (Standard Form 299-Transportation and Utility Systems and Facilities on Federal Lands) with the USACE. Spire is proposing to cross this property as part of its HDD of the Mississippi River. Placement of the HDD entry/exit pits will be located outside the boundaries of this property.

Accumulating silt reduced the productivity of this wetland area, and navigation and recreational boating helped move bottom sediments into backwaters and chutes, reducing the number of wetland habitats. In an effort to balance navigation needs and the need for wildlife habitat, Congress authorized the Environmental Management Program in 1986. This federal program is designed to protect the resources and guide future river management. One of the elements of this program was the construction of Habitat Rehabilitation and Enhancement Projects. Water regulation is now possible depending on river elevations, further improving habitat for fish and wildlife. Many people visit the riverine area to enjoy the outdoors, hunt and hike on the new sediment deflection levee or fish below the water control structures (MDOC, 2016a), (MDOC, 2016d). Consultations with the USACE and MDOC regarding the Upper Mississippi Conservation Area are ongoing and will be provided in the FERC application. Copies of correspondence are included in Resource Report 1, Appendix 1-C.

3.2.3.3 Karst Geologic Features

Karst is a landform where layers of water soluble rock, such as limestone, dolomite, or gypsum are found. These rocks are dissolved by slightly acidic groundwater forming features such as caves and sinkholes. Many species found in caves are rare and require the specific environmental conditions of caves for breeding and hibernation. Karst Geologic Features were identified across the project in Illinois between MP 42.5 and MP 43.7. Further discussion on karst formations and how they relate to RTE species can be found in Section 3.4.1.4.

3.2.3.4 Other Habitats

In preliminary consultation, MDOC identified a shrub swamp habitat within Landgrant 1692 and a wet mesic bottomland forest habitat within Landgrant 3281. Each Landgrant is within 0.5-miles of 24-inch pipeline (MDOC, 2016b). Since the habitats are not crossed by the Project, Spire does not anticipate adverse effects to the shrub swamp wetland habitat within Landgrant 1692 or the wet mesic bottomland forest habitat Landgrant 3281.

Spire will coordinate with the MDOC should the proposed 24-inch pipeline route be rerouted or these habitats be encountered by the Project.

3.2.3.5 Migratory Bird Treaty Act

According to the North American Bird Conservation Initiative, the Project is located within Bird Conservation Region 22 - Eastern Tallgrass Prairie (NABCI, 2016). The modern landscape of the Eastern Tallgrass Prairie is dominated by agriculture. Threats to the upland and wetland habitats of this region include urbanization, recreational development, and agricultural expansion. High priority grassland birds that persist in some areas include the Greater Prairie-Chicken and Henslow's Sparrow. Cerulean Warblers are in some wooded areas, and Red-headed Woodpecker leads the list of savanna specialists.

The USFWS indicated that MBTA habitat would likely be associated with the habitat for federally-listed bat species as the majority of the pipeline route traverses agricultural lands that will be disturbed by agricultural activities (USFWS, 2016d). Spire has routed the Project such that it avoids trees to the extent practicable. Generally, locations of trees within the Project area are associated with property lines or riparian areas and are not associated with large tracts of contiguous forest. In locations of streams or wetlands, Spire will reduce its construction right-of-way width to 75 feet in order to minimize the acreage of clearing that will be required for the Project. Spire anticipates commencing construction in Q1 2018, with an anticipated in-service date of November 1, 2018. Tree clearing is anticipated to occur prior to April 1. Table 3.2-2 identifies the birds of conservation concern listed on the IPaC.

3.2.3.6 Bald and Gold Eagle Protection Act

The USFWS indicated that Bald Eagles may nest near streams or waterbodies in the Project area (USFWS, 2016d). Bald Eagles are protected under the Bald and Golden Eagle Protection Act ("BGEPA") which is administered by the

USFWS. Bald eagles are typically associated with large, tall trees near large waterbody crossings. Spire is coordinating with the USFWS Rock Island Field Office to determine the locations of known bald eagle nests within the vicinity of the Project.

Biological surveys have been conducted on the south side of the Mississippi River and no bald eagle nests were observed. Spire is currently conducting surveys within the Project areas and will continue to identify if bald eagle nests are present. If an active bald eagle nests is observed in the Project area prior to or during construction, Spire will coordinate with the USFWS Rock Island Field Office to implement the appropriate minimization measures during construction of the Project and adhere to the buffer requirements established in the USFWS Bald Eagle Monitoring Guidelines (September 2007).

3.2.3.7 Construction and Operation Impacts

In locations of streams or wetlands, Spire will reduce its construction right-of-way width to 75 feet in order to minimize the acreage of clearing that will be required for the Project. The trenchless crossing methods are not likely to adversely affect the Mississippi and Missouri Rivers. Temporary noise from the HDDs is anticipated for the duration of the drill, but will be mitigated by appropriate sound barriers and mufflers.

Consultations with the USFWS, IDNR, and MDOC are ongoing and the results will be provided in the FERC application.

Table 3.2-2. Birds of Conservation Concern Potentially Occurring in the Vicinity of the Project

Common Name (*Scientific Name*)	Colonial Water Bird	Breeds in Region	Ground Nesting	Shrub Nesting	Tree Nesting	Nesting Range
Acadian Flycatcher (*Empidonax virescens*)	-[1]	X[2]	-	-	X	May-July
Bell's Vireo (*Vireo bellii*)	-	X	-	X	-	May-July
Black-billed Cuckoo (*Coccyzus erythropthalmus*)	-	X	-	-	X	May-July
Black-crowned Night-heron (*Nycticorax nycticorax*)	X	X	X	-	-	May-July
Blue-winged Warbler (*Vermivora pinus*)	-	X	-	X	-	May-July
Cerulean Warbler (*Dendroica cerulea*)	-	X	-	-	X	May-July
Dickcissel (*Spiza americana*)	-	X	X	-	-	May-July
Field Sparrow (*Spizella pusilla*)	-	X	X	-	-	May-July
Fox Sparrow (*Passerella iliaca*)	-	X	-	-	X	May-July
Henslow's Sparrow (*Ammodramus henslowii*)	-	X	X	-	-	May-July
Kentucky Warbler (*Oporornis formosus*)	-	X	-	-	X	May-July
Least Bittern (*Ixobrychus exilis*)	X	X	-	-	-	May-July
Loggerhead Shrike (*Lanius ludovicianus*)	-	X	-	X	-	May-July
Mississippi Kite (*Ictinia mississippiensis*)	-	X	-	-	X	May-July
Northern Flicker (*Colaptes auratus*)	-	X	-	-	X	Present Year Round
Peregrine Falcon (*Falco peregrinus*)	-	X	-	-	-	March-July
Pied-billed Grebe (*Podilymbus podiceps*)	X	X	-	-	-	May-July
Prothonotary Warbler (*Protonotaria citrea*)	-	X	-	-	X	May-July
Red-headed Woodpecker (*Melanerpes erythrocephalus*)	-	-	-	-	X	Present Year Round
Rusty Blackbird (*Euphagus carolinus*)	X	-	-	-	-	Winter Presence
Short-eared Owl (*Asio flammeus*)	-	-	X	-	-	Winter Presence
Willow Flycatcher (*Empidonax traillii*)	-	X	-	X	-	May-July
Wood Thrush (*Hylocichla mustelina*)	-	X	-	-	X	May-July
Worm Eating Warbler (*Helmitheros vermivorum*)	-	X	-	-	X	May-July

Notes:

[1] A hyphen denotes that the bird does not nest in this habitat.

[2] An X denotes applicable.

3.3 Vegetation

3.3.1 Existing Resources

Three dominant vegetation cover types will be affected by the Project: agriculture, forested habitat, and palustrine wetlands. Open lands and residential communities were also crossed by the Project, but were at minimal cover. Line 880 modifications are primarily located within existing easement or maintained residential areas. Table 3.3-1 identifies the vegetation communities affected by construction and operation of the Project.

3.3.1.1 Agriculture (Cropland)

The majority of the environmental survey area consists of this vegetation type. Cropland includes areas that are regularly cultivated and used to grow row crops. Surveyed areas included cropland that had recently been harvested and fallow or idle areas that appeared to be regularly used to grow crops. Commonly observed crops were corn and soybeans.

3.3.1.2 Forested Habitat

This vegetation type includes shrubland and forested areas having a predominance of trees that lose their leaves at the end of the frost-free season or at the beginning of a dry season. Common species observed in the environmental survey area include amur honeysuckle (*Lonicera maackii*), hickory species (*Cary*a sp.), eastern black walnut (*Juglans nigra*), black locust (*Robinia pseudoacacia*), American elm (*Ulmus Americana*), American sycamore (*Platanus occidentalis*), and box elder (*Acer negundo*).

3.3.2 Construction and Operation Impacts

Existing land use classifications and wetland acreages were based on data collected during the stream and wetland identification surveys that began in September 2016. Field investigations are ongoing, however aerial imagery from ESRI world imagery was utilized to supplement the remaining areas (Microsoft, 2015). Three dominant vegetation cover types will primarily be affected the 24-inch pipeline construction workspace, ATWS, aboveground facilities, access roads, and contractor yards. Line 880 modifications are primarily located within existing easement or maintained residential areas. The cover types include; agriculture, forested habitat, and palustrine wetlands. The Project area consists of approximately 818.4 acres of agricultural land. Forested areas cover approximately 37.1 acres of the Project area. Palustrine wetlands cover approximately 3.1 acres of the Project area. Additional information on temporary and permanent impacts from construction and operation of the Project are discussed below and in Resource Report 8.

Table 3.3-1. Vegetation Communities Affected by Construction and Operation of the Project[1]

Facility (County, State)	Agricultural (acres)[2]		Mixed Hardwood Forest (acres)[2]		Palustrine Wetland (acres)[3]		Total (acres)	
	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation
24-Inch Pipeline								
Scott County, Illinois	31.78	17.54	4.96	3.00	0.10	0.04	36.84	20.58
Greene County, Illinois	267.37	148.79	7.21	4.41	2.11	0.22	276.69	153.42
Jersey County, Illinois	151.90	84.64	9.08	5.66	0.22	0.01	161.20	90.31
St. Charles County, Missouri	122.91	68.60	2.38	2.38	0.56	0.34	125.85	71.32
St. Louis County, Missouri	0.00	0.00	2.47	1.42	0.00	0.00	2.47	1.42
Subtotals	**573.96**	**319.57**	**26.10**	**16.87**	**2.99**	**0.61**	**603.05**	**337.05**
Line 880								
St. Louis County, Missouri	0.46	0.01	1.99	0.04	0.00	0.00	2.45	0.05
Subtotals	**0.46**	**0.01**	**1.99**	**0.04**	**0.00**	**0.00**	**2.45**	**0.05**
Aboveground Facilities								
Rex Receipt Station								
Scott County, Illinois	2.94	2.18	0.00	0.00	0.00	0.00	2.94	2.18
Laclede/Lange Delivery Station								
St. Louis County, Missouri	0.00	0.00	2.36	1.66	0.00	0.00	2.36	1.66
Redman Delivery Station								
St. Louis County, Missouri	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MRT Bi-directional Station								
St. Louis County, Missouri	0.00	0.00	1.01	0.17	0.00	0.00	1.01	0.17
Subtotals	**2.94**	**2.18**	**3.37**	**1.83**	**0.00**	**0.00**	**6.31**	**4.01**
Cathodic Protection								
TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Access Roads								
Scott County, Illinois	0.89	0.15	0.00	0.00	0.00	0.00	0.89	0.15
Greene County, Illinois	4.57	0.00	0.00	0.00	0.03	0.00	4.60	0.00

Table 3.3-1. Vegetation Communities Affected by Construction and Operation of the Project (Continued)[1]

Facility (County, State)[1]	Agricultural (acres)		Mixed Hardwood Forest (acres)		Palustrine Wetland (acres)[3]		Total (acres)	
	Construction	Operation	Construction	Operation	Construction	Operation	Construction[2]	Operation
Access Roads (continued)								
Jersey County, Illinois	2.31	0.00	0.53	0.00	0.00	0.00	2.84	0.00
St. Charles County, Missouri	3.47	0.00	0.02	0.00	0.00	0.00	3.50	0.00
St. Louis County, Missouri	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Subtotals	**11.23**	**0.15**	**0.55**	**0.00**	**0.03**	**0.00**	**11.82**	**0.15**
ATWS								
Scott County, Illinois	10.64	0.00	0.85	0.00	0.00	0.00	11.49	0.00
Greene County, Illinois	77.65	0.00	0.53	0.00	0.05	0.00	78.23	0.00
Jersey County, Illinois	42.01	0.00	3.13	0.00	0.00	0.00	45.14	0.00
St. Charles County, Missouri	54.80	0.00	0.12	0.00	0.04	0.00	54.96	0.00
St. Louis County, Missouri	0.00	0.00	0.42	0.00	0.00	0.00	0.42	0.00
Subtotals	**185.10**	**0.00**	**5.05**	**0.00**	**0.09**	**0.00**	**190.24**	**0.00**
Contractor Yards[4]								
St. Charles County, Missouri	6.53	0.00	0.00	0.00	0.00	0.00	6.53	0.00
Madison County, Illinois	38.14	0.00	0.00	0.00	0.00	0.00	38.14	0.00
Subtotals	**44.67**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**44.67**	**0.00**
Totals[5]	**818.36**	**321.92**	**37.07**	**18.74**	**3.11**	**0.61**	**858.54**	**341.27**

Notes:

1 Existing land use classifications and wetland acreages were based on data collected during the field investigations, aerial imagery from ESRI World Imagery (NAIP, 2015), and NWI datasets.

2 Land affected during construction is inclusive of the 50-foot permanent easements, 40-foot TWS and ATWS. Operational impacts are inclusive of the permanent easement, permanent facilities, and permanent access roads.

3 Wetland totals are also encompassed as part of other land use types, including agriculture and forest land. Therefore, totals include overlap of land use types and will not equal the sums in Resource Report 8. Following completion of wetland delineations, wetlands will be incorporated as a land use type for the FERC application. Area affected by construction is the total area of wetland within the construction right-of-way. Area affected by operation on PEM wetlands are 0.0 as these wetlands will revert back to the same type following construction. Operational impacts on PSS wetlands in this column are based on a 10-foot-wide operational impact that will be converted to herbaceous wetlands due to pipeline maintenance. Operational impacts on PFO wetlands in this column reflect potential for selective thinning of trees within 15 feet of the pipeline that have roots that could compromise the integrity of the pipeline coating.

4 No operational impacts are anticipated as contractor yards will be used during construction and allowed to return to pre-construction conditions after Project completion.

5 May not equal the sum of the row or column due to rounding.

Vegetation along the HDD paths for the Mississippi River and Missouri River would not be cleared or maintained during operations. Between the HDD entry and exit locations, access is required to perform inadvertent return monitoring and to layout the guidance system wireline (unless a gyroscopic tool is required). The access will require line of sight to survey the guidance system. This may require selective cutting of limbs, but no trees will be removed. Impacts to unique or sensitive vegetation types or communities, if applicable, will be provided in the FERC application pending the results of consultations with IDNR and MDOC.

3.3.3 Noxious Weeds and Invasive Species

To avoid and minimize the potential for the introduction of noxious weed and invasive species seeds to new areas in the Project corridor, Spire has prepared a Noxious Weeds/Invasive Plant Control Mitigation Plan, included in Appendix 3-A. Implementation of this plan will avoid and/or minimize adverse effects from noxious and invasive plant species.

3.4 Endangered, Threatened, and Special Status Species

3.4.1 Existing Resources

Spire initiated consultation regarding the Project with the USFWS, IDNR, and MDOC in June 2016. Consultations with all three agencies are ongoing, however initial studies were performed utilizing the USFWS's IPaC System and data from the Illinois Natural Heritage Program. Copies of correspondence are included in Resource Report 1, Appendix 1-C. Federally-protected and state-protected species that may occur in the vicinity of the Project are listed in Table 3.4-1. RTE aquatic species as well as construction and operation impacts were previously discussed in Section 3.1.2, Fisheries of Special Concern.

3.4.1.1 Bird Species

Least Tern (*Sterna antillarum*), Piping Plover (*Charadrius melodus*), and Red Knot (*Calidris canutus rufa*) were identified from the USFWS's IPaC System because of their association with habitat at the Mississippi River and Missouri River crossings, and Line 880's proximity to these rivers. These species are associated with shorelines and river islands.

The Red Knot species is typically associated with large waterbodies with gravel and/or sandy edges. Based on a literature review and available observation data online, Red Knot is not likely to breed within the Project area, and may only be present as a transient species seeking out foraging opportunities along the Mississippi and Missouri Rivers.

Table 3.4-1. Federally-Listed and State-Listed Species Potentially Occurring in the Vicinity of the Project

Common Name (*Scientific Name*)	Federal Status	Illinois State Status	Missouri State Status	Project Components	Anticipated Project Impacts and Habitat Assessment
Birds					
Least Tern (*Sterna antillarum*)	Endangered	Endangered	Endangered	Line 880	The species nests on barren to sparsely vegetated sandbars along rivers, sand and gravel pits, lake and reservoir shorelines, and occasionally gravel rooftops. The species could be present along the major river crossings, however the HDD is not likely to adversely affect the species.
Piping Plover (*Charadrius melodus*)	Threatened	Endangered	NA	Line 880	The species utilizes wide, flat, open, sandy beaches for habitat and often nest along small creeks or wetlands. The HDD is not likely to adversely affect the species.
Red Knot (*Calidris canutus rufa*)	Threatened	Threatened	NA	Line 880	The species utilizes large waterbodies with gravel and/or sandy edges. The species is not likely to breed in the area and the Project is not likely to adversely affect the species.
Migratory Bird Species	MBTA	NA	NA	24-Inch Pipeline and Line 880	Spire plans to reduce the construction right-of-way width to 75 feet in riparian habitat.
Bald eagles (*Haliaeetus leucocephalus*)	BGEPA	BGEPA	BGEPA	24-Inch Pipeline and Line 880	The species utilized large, tall trees near rivers or reservoirs and prefer trees which have 1 or two open edges in which they roost or nest in the upper open branches, allowing for easy surveillance for food and accessibility.Spire will coordinate with the USFWS Rock Island Field Office to determine the locations of known bald eagle nests within the vicinity of the Project. If the data identifies bald eagle nests within the vicinity of the Project, Spire will consult with the USFWS Rock Island District to implement the appropriate mitigation measures during construction of the Project.
Aquatics					
Higgins Eye Clam (*pearlymussel*) (*Lampsilis higginsii*)	Endangered	Endangered	NA	24-Inch Pipeline	The species utilizes larger rivers where they are usually found in deep water with moderate currents. The HDD is not likely to adversely affect the species.
Pallid sturgeon (*Scaphirhynchus albus*)	Endangered	Endangered	Endangered	24-Inch Pipeline	Project will have no effect to the species. The HDD is not likely to adversely affect the species.
Lake Sturgeon (*Acipenser fluvescens*)	NA	NA	Endangered	24-Inch Pipeline and Line 880	TBD, consultations with the MDOC are ongoing and will be provided in the FERC filing.
Flathead chubs (*Platygobio gracilis*)	NA	NA	Endangered	24-Inch Pipeline and Line 880	TBD, consultations with the MDOC are ongoing and will be provided in the FERC filing.
State-listed mussel species	NA	No listed species present on the natural heritage program search.	TBD	Line 880	TBD, consultations with the MDOC are ongoing and will be provided in the FERC filing.
Mammals					
Indiana bat (*Myotis sodalis*)	Endangered	Endangered	Endangered	24-Inch Pipeline and Line 880	Mist net surveys to determine the presence/absence of listed bats will be conducted between May 15 and August 15, 2017.
Northern long-eared bat (*Myotis septentrionalis*)	Endangered	Threatened	Vulnerable	24-Inch Pipeline and Line 880	Mist net surveys to determine the presence/absence of listed bats will be conducted between May 15 and August 15, 2017.
Gray bat (*Myotis grisescens*)	Threatened	Endangered	Threatened	Line 880	Portal searches to be conducted in 2016 and 2017. Mist net surveys to be conducted between May 15 and August 15, 2017.

Table 3.4-1. Federally-Listed and State-Listed Species Potentially Occurring in the Vicinity of the Project (Continued)

Common Name (Scientific Name)	Federal Status	Illinois State Status	Missouri State Status	Project Components	Anticipated Project Impacts and Habitat Assessment
Plants					
Decurrent false aster (*Boltonia decurrens*)	Threatened	Threatened	Endangered	24-Inch Pipeline and Line 880	The species is found in moist, sandy floodplains and prairie wetlands Surveys were completed in October 2016; no species were located.
Eastern prairie fringed orchid (*Platanthera leucophaea*)	Threatened	Endangered	NA	24-Inch Pipeline	The species is found in mesic prairies to wetlands, requires full sun for optimum growth and flowering and a grassy habitat with little or no woody encroachment. If necessary, surveys will be performed in 2017.
Mead's milkweed (*Asclepias meadii*)	Threatened	Endangered	NA	Line 880	The species is found in mesic to dry mesic, upland tallgrass prairie or glade/barrens. Its habitat is characterized by vegetation adapted for drought and fire. It persists in stable late-successional prairies. If necessary, surveys will be performed in 2017.
Running buffalo clover (*Trifolium stoloniferum*)	Endangered	NA	Endangered	Line 880	The species is found in mesic habitats of partial to filtered sunlight, where there is a prolonged pattern of moderate periodic disturbance, such as mowing, trampling, or grazing. It is most often found in regions underlain with limestone or other calcareous bedrock. If necessary, surveys will be performed in 2017.
Groundplum milkvetch (*Astragalus crassicarpus* var. *trichocalyx*)	NA	Endangered	NA	24-Inch Pipeline	Located within the Principia Hills Prairies West Illinois Natural Area Inventory Site. The species is found in Surveys will be performed in 2017.

Notes:

[1] Based on USFWS's IPaC System search, Illinois Natural Heritage Program data, and a preliminary Missouri Natural Heritage Review Report from the MDOC. Consultations regarding RTE species surveys are still pending. Spire received confirmation to perform surveys for the presence or absence of Decurrent false aster within the Project area in the fall of 2016.

[2] NA - Not included in state or federal listing for the Project area.

3.4.1.2 Bald and Gold Eagle Protection Act

Spire is conducting biological field surveys to identify streams and wetlands within a 300-foot corridor along the 24-inch pipeline and within an approximate 100 to200-foot corridor along Line 880. As part of these surveys, Spire will survey potential habitat along the Mississippi River and Missouri River for the presence of bald eagle nests. Biological surveys have been conducted on the south side of the Mississippi River and no bald eagle nests were observed. In addition, Spire will coordinate with the USFWS Rock Island Field Office to determine the locations of known bald eagle nests within the vicinity of the Project. If data or surveys identify bald eagle nests within the vicinity of the Project, Spire will consult with the USFWS Rock Island District to implement the appropriate mitigation measures during construction of the Project.

3.4.1.3 Migratory Bird Treaty Act

During the July 18, 2016 meeting, the USFWS indicated that MBTA habitat would likely be associated with the forested habitat for federally-listed bat species as the majority of the 24-inch pipeline route traverses agricultural lands that will be disturbed by construction activities. Line 880 modifications are primarily located within existing easement or maintained residential areas, no significant affects to migratory birds associated with forested habitat are anticipated. Table 3.2-2 identifies the birds of conservation concern that were listed in the IPaC as potentially occurring in the vicinity of the Project

3.4.1.4 Bat Species

The Project is within the ranges of three federally-listed bats, including the endangered Indiana bat, endangered gray bat, and threatened northern long-eared bat. Seasonal tree clearing restrictions prohibit tree clearing are anticipated to be between April 1 and October 15.

During the July 8, 2016 meeting, the USFWS Rock Island Field Office recommended performing mist net surveys, therefore, Spire intends to conduct mist net surveys to determine the probable presence/absence of listed bats (USFWS, 2016d). Surveys will be conducted between May 15 and August 15, 2017, in accordance with the latest Range-wide Indiana Bat Survey Protocols; currently the 2016 Range-wide Indiana Bat Summer Survey Guidelines, April 2016 (Guidelines). Due to the linear nature of the Project, mist net surveys will follow protocols required for a linear project in the Ozark-Central Recovery Unit for Indiana bat. If Indiana bats are not captured and northern long-eared bat roost trees are not identified within 0.25-mile of the Project area, no seasonal restrictions on tree clearing would be expected. Spire will continue to coordinate with the USFWS.

If Indiana bats are captured during mist netting, radio-telemetry will be required in order to document detailed habitat use. Due to the final Endangered Species Act (“ESA”) Section 4(d) rule for the northern long-eared bat, which does not prohibit incidental take associated with tree clearing under most circumstances, USFWS would not require northern long-eared bats to be tracked to find known roost trees. Gray bats would not be tracked to diurnal roosts, due to difficulty in detecting bats located in subterranean voids (e.g., caves/mines), and the overall low effect of Project development on gray bats or their habitat.

A mist-net study plan will be prepared and submitted to the USFWS Rock Island Field Office for their approval prior to the commencement of any presence/absence survey work. Once surveys are complete, Spire will provide a report to the USFWS Rock Island Field Office for review and concurrence.

Spire also conducted a cursory GIS desktop analysis to determine if there is potential for caves or other underground features in the vicinity of the Project. Karst topography and mining resources were overlaid and revealed that the Project is in a karst region, and karst geologic features were between MP 42.5 and MP 43.7. Also, numerous sinkholes could be detected via aerial photograph analyses. Further discussion on karst formations can be found in Resource Report 6.

Spire will conduct an assessment of these potential geologic features within Spire's environmental survey corridor to determine suitability of bat habitat. Portal assessments will be conducted concurrently with biological field surveys. Suitable portals that cannot be ruled out during the survey will be harp-trapped in the spring, between April 1 and May 1, pending USFWS approval.

These species are also state-listed species in Illinois and Missouri (the exception being northern long -eared bat which is listed as vulnerable in Missouri). Discussions with ILDNR and MDOC regarding bat species are ongoing.

3.4.1.5 Aquatic Species

As previously discussed in Section 3.1.2, Fisheries of Special Concern, the Project is within the ranges of Higgins eye clam and Pallid sturgeon. Higgins eye clam is not known to or believed to occur within the immediate Project area but can be found locally within the Upper Mississippi River. Pallid sturgeons are known to or believed to occur downstream of the 24-inch pipeline crossing of the Mississippi River and within the 24-inch pipeline crossing of the Missouri River (USFWS, 2013).

3.4.1.6 Plant Species

A review of the USFWS's IPaC System indicated that Decurrent false aster, Eastern prairie fringed orchid, Mead's milkweed, and Running buffalo clover are potentially located within the vicinity of the Project.

Based on further consultation with the USFWS on August 2nd and 8th, 2016, Decurrent false aster surveys will be limited to Jersey County, Illinois in locations of forested floodplains that are frequently flooded and disturbed (Allred, 2016). One location, Otter Creek, was identified for Decurrent false aster surveys. Surveys for Decurrent false aster were completed in October 2016 and no Decurrent false asters were located. A report of the survey will be provided in the FERC application. Although Decurrent false aster is listed in the counties crossed by the Project in Missouri, the Project will not cross locations of forested floodplains in Missouri, with the exception of the area south of the Mississippi River. Spire will be crossing this area via HDD as part of its crossing of the Mississippi River, therefore, no further surveys in these areas are necessary for Decurrent false aster.

Spire is currently conducting biological field surveys for wetlands and waterbodies within a 300-foot survey corridor over the entire Project where landowner permissions have been granted. During these surveys, Spire will identify areas of potential high-quality habitat for Running buffalo clover, Mead's milkweed, and Eastern prairie fringed orchid. Based on the results of Spire's initial surveys, and in coordination with the USFWS, Spire will

determine if there is a need to conduct species-specific surveys for these three plants in 2017. If necessary, surveys will be conducted between late April and early July in accordance with the flowering period of these species.

If surveys are completed, Spire will provide the USFWS with a report for review and concurrence.

Data from the Illinois Natural Heritage Program indicated that the Project could be in close proximity to a recorded population of groundplum milkvetch (*Astragalus crassicarpus* var. *trichocalyx*) at one location in Jersey County, Illinois. Survey permission at this location is pending. Consultations with the IDNR are ongoing.

3.4.1.7 Communities of Concern

Data from the Illinois Natural Heritage Program indicated that the 24-inch pipeline crosses the Principia Hills Prairies West Illinois Natural Area Inventory Site, which consists of a high quality Loess Hill Prairie Natural Community and Natural Heritage Landmark. Consultations with the IDNR are ongoing and will be provided in the FERC application.

The preliminary Natural Heritage Review Report provided by the MDOC identified several communities of concern that may be in close proximity to the Project. They include, the Upper Mississippi Conservation area (crossed by the 24-inch pipeline), St. Louis County Spanish Lake (within 0.25 miles), Shrub swamp within Landgrant 1692 (within 0.5 miles from the Project), a wet mesic bottomland forest within Landgrant 3281 (within 0.5 miles of the Project), and karst geologic features. Spire does not anticipate impacts to these communities.

Additional information on the communities of concern can be found in the previously discussed in Sections 3.1.2 and 3.2.3. Copies of correspondence are included in Resource Report 1, Appendix 1-C.

3.4.2 Construction and Operation Impacts

Below is a discussion related to potential construction and operation-related impacts to endangered and threatened species and migratory birds.

3.4.2.1 Bird Species

Federal Species

The trenchless crossings of the Mississippi River and Missouri River would avoid and/or minimize the potential effects of the Project on the river shorelines and island habitat that federally listed birds may utilize. Furthermore, Line 880 does not cross large waterbodies containing habitat for these species. According to the reasons listed above, Spire has determined that the Project is not likely to adversely affect these species.

Bald and Gold Eagle Protection Act

Spire is conducting biological field surveys to identify streams and wetlands within a 300-foot corridor along the 24-inch pipeline and within an approximate 100 to200-foot corridor along Line 880. As part of these surveys, Spire will survey potential habitat along the Mississippi River and Missouri River for the presence of bald eagle nests. Biological surveys have been conducted on the south side of the Mississippi River and no bald eagle nests were observed. In addition, Spire will coordinate with the USFWS Rock Island Field Office to determine the locations of known bald eagle nests within the vicinity of the Project.

Migratory Bird Treaty Act

Displacement, avoidance and potential changes to migration, foraging and mating resulting from construction activities and the loss or conversion of habitat poses the greatest risk of impact to migratory birds. Because of the guidance given by the USFWS, the removal of trees causes the greatest concern to migratory birds related to the proposed Project. In order to minimize these risks, Spire implemented the following mitigation measures; Spire has routed its pipeline such that it avoids trees to the extent practicable by concentrating the majority of the 24-inch pipeline through agricultural fields and while most wooded tracts are associated with riparian corridors or property lines Spire limited the construction right-of-way to the minimal width needed within wooded areas to safely construct the proposed facilities. No interior forests are crossed by the Project, however the largest contiguous tract of forest crossed by Project is located along the Mississippi River. Spire has maximized the use of existing rights-of-ways by colocating the route with an existing linear easement as to further reduce impacts to the forest in the Mississippi River Valley. In addition, the Line 880 modifications are primarily located within existing easement or maintained residential areas.

Spire is anticipating to clear trees before April 1st provided that all federal and state permits are received. The implementation of the avoidance and minimization measures as well as the abundance of habitat adjacent to the Project area would prevent any population-level impacts or significantly measureable negative impacts on migratory birds.

3.4.2.2 Bat Species

Spire is continuing discussion with the USFWS related to presence of the Indiana bat, northern long-eared bat, and gray bat within the Project area. Spire anticipates conducting mist net surveys in 2017 and will further coordinate with USFWS, IDNR, and MDOC regarding bat species. Spire will submit additional information related to the bats in the FERC application.

3.4.2.3 Aquatic Species

Spire is proposing to cross the Mississippi River and Missouri River via HDD, therefore no in-stream construction or disturbance to the stream bed is anticipated at these locations. Although HDD methods generally avoid impacts on water quality by avoiding impact to the stream bank and bottom, a potential for an inadvertent return of drilling mud may occur. The release could result in a plume extending from the discharge point downstream. The HDD contingency for inadvertent returns was discussed in Section 3.1.3.

It is anticipated that HDD of these waterbodies would avoid potential effects of the Project on the Higgins Eye Clam and Pallid sturgeon, therefore Spire has determined that the Project is not likely to adversely affect these species.

3.4.2.4 Plant Species

No Decurrent false asters were found within the 24-inch pipeline during the October surveys and no further surveys are necessary for Decurrent false aster for the Project. Consultation with the USFWS is ongoing and additional information, including the survey report, will be provided with in the FERC application.

Spire will determine if there is a need to conduct plant species-specific surveys for Running buffalo clover, Mead's milkweed, and Eastern prairie fringed orchid. If necessary and upon the approval of the USFWS, surveys will be conducted in 2017 between late April and early July in accordance with the flowering period of these species.

Survey permission at the location of the Groundplum milkvetch is pending. Additional information will be provided in the FERC application.

3.4.2.5 Communities of Concern

Consultations with the IDNR and MDOC are still pending and will be provided in the FERC application.

3.4.3 Agency and Stakeholder Consultation

In August 2016, Spire mailed letters providing preliminary Project information to the USFWS Rock Island Office, IDNR, and MDOC. Correspondence with the agencies is ongoing and will be provided in the FERC application. Submittals made to these agencies are included in Resource Report 1, Appendix 1-C.

3.5 References

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APPENDIX 3-A

Noxious Weed/Invasive Plant Control and Mitigation Plan

Spire STL Pipeline Project

Noxious Weeds/Invasive Species Control and Mitigation Plan

FERC Docket No. PF16-9-000

Draft
October 2016

Public

Table of Contents

Acronyms and Abbreviations

FERC	Federal Energy Regulatory Commission
Plan	FERC's Upland Erosion Control, Revegetation, and Maintenance Plan
Project	Spire STL Pipeline Project
Spire	Spire STL Pipeline LLC
USDA	United States Department of Agriculture

Noxious Weeds/Invasive Species Control and Mitigation Plan

This Noxious Weeds/Invasive Species Control and Mitigation Plan describes the general control measures to be implemented by Spire STL Pipeline LLC ("Spire") and its contractors on the Spire STL Pipeline Project ("Project"). Where deemed appropriate and feasible, measures identified in this plan will be applied to work areas during construction and the permanent easement during operation to avoid or minimize the spread of noxious weeds or invasive plant species during the construction and operation of the Project.

1.1 Noxious Weeds and Invasive Species

Lists of potential noxious and invasive weeds were obtained from the United States Department of Agriculture's ("USDA's") Introduced, Invasive and Noxious Plants Federal Noxious Weed List, the Illinois Noxious Weed Law, and the Missouri Noxious Weed List investigations (USDA, 2013; Illinois Administrative Code, 2002; and Missouri Department of Agriculture, 2011). Noxious weed surveys were performed concurrently with the stream and wetland surveys. On the 24-inch pipeline, annual ragweed (*Ambrosia artemisiifolia*) and great ragweed *(Ambrosia trifida*) were the dominant species, while Line 880 contained trace amounts of multiflora rose (*Rosa multiflora*) and Canada thistle (*Cirsium arvense*).

Spire coordinated with the USDA's Conservation Program in Scott, Greene, and Jersey Counties, Illinois and in St. Charles and St. Louis County, Missouri for their recommendations on noxious weed best management practices across the Project (Behner, 2016), (Fuller, 2016), (Muenks, 2016), (Perkins, 2016), and (Wamsley, 2016). Table 1.1-1 details the species present on the states noxious weed list.

1.2 Control and Mitigation Plan

To avoid and minimize the potential for the introduction of these seeds to new areas in the Project corridor, Spire will implement the following management strategies to control exotic, noxious, and invasive species.

1. The avoidance of exotic and invasive species in organic materials brought on-site. If available, certified weed-free mulch, seed-mix, straw and hay bales will be used to construct sediment control devices during construction.
2. Brush off equipment in high cover areas as to prevent the transfer of noxious species to other clear portions of the Project.
3. Adhere to erosion control measures in Federal Energy Regulatory Commission's ("FERC's") *Upland Erosion Control, Revegetation, and Maintenance Plan* (2013a) ("Plan") and FERC's *Wetland and Waterbody Construction and Mitigation Procedures* (2013b) to ensure that sediment movement and the associated movement of non-native seeds into newly disturbed soils are minimized.

Table 1.1-1. State-Listed Noxious Weeds

Common Name	Scientific Name
Illinois	
Common ragweed	*Ambrosia artemisifolia*
Giant ragweed	*Ambrosia trifida*
Marijuana	*Cannabis staiva*
Milk Thistle	*Carduus nutans*
Canada thistle	*Cirsium arvense*
Kudzu	*Pueraria montana*
Perennial sowthistle	*Sonchus arvensis*
Columbus grass	*Sorghum almum*
Johnsongrass	*Sorghum halepense*
Missouri	
Marijuana	*Cannabis staiva*
Canada thistle	*Cirsium arvense*
Field bindweed	*Convolvulus arvensis*
Common teasel	*Dispacus fullonum*
Purple loosestrife	*Lythrum salicaria*
Scotch thistle	*Onopordum acanthium*
Kudzu	*Pueraria montana*
Multiflora rose	*Rosa multiflora*
Johnsongrass	*Sorghum halepense*

4. Use construction techniques along the pipeline route that minimize the time that bare soil is exposed and, therefore, minimize the opportunity for exotic species to become established.
5. All disturbed areas will be reseeded promptly after final grading, weather and soil conditions permitting, and in consideration of written recommendations from the local soil conservation authorities. Prompt reseeding will ensure that bare soil is not available for exotic or invasive species for an extended period of time.

6. As described in the FERC Plan, mulch, consisting of weed-free straw or hay or other erosion-control materials will be applied if final grading and installation of permanent erosion control measures are not completed within 20 days after the trench is backfilled or seeding cannot be completed properly due to scheduling outside of recommended seeding dates.
7. Should landowners identify an area where noxious weeds are the dominant vegetation within Spire's permanent easement, Spire will coordinate with landowners and applicable agencies to address concerns.
8. For areas where noxious weeds dominate the vegetation in the permanent easement, Spire will take measures to reduce the spread of noxious weeds, where possible. Equipment used for maintenance activities will be cleaned prior to leaving the affected area.

The USDA's Conservation Program representatives in Illinois have requested to review the management strategies for noxious weeds, Spire will provide further communication in the final FERC application.

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APPENDIX 3-B

Species Specific Reports for Rare, Threatened, and Endangered Species Surveys (to be provided in the FERC application)