MVP Southgate Project

Docket No. PF18-4-000

Draft

Resource Report 3 – Fish, Wildlife, and Vegetation

August 2018

MVP Southgate Project
Draft Resource Report 3 – Fish, Wildlife, and Vegetation

Resource Report 3 Filing Requirements	
Information	**Location in Resource Report**
Minimum Filing Requirements	
1. Classify the fishery type of each surface waterbody that would be crossed, including fisheries of special concern. (§ 380.12(e)(1)) This includes commercial and sport fisheries as well as coldwater and warmwater fishery designations and associated significant habitat.	Section 3.2.2
2. Describe terrestrial and wetland wildlife and habitats that would be affected by the project. (§ 380.12(e)(2)) Describe typical species with commercial, recreational or aesthetic value.	Sections 3.3 and 3.4
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. (§ 380.12(e)(3)) • Include unique species or individuals and species of special concern. • Include nearshore habitats of concern.	Section 3.4 and Table 3.4-1
4. Describe the effects of construction and operation procedures on the fishery resources and proposed mitigation measures. (§ 380.12(e)(4)) Be sure to include offshore effects, as needed.	Section 3.2.4
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. (§ 380.12(e)(4))	Sections 3.3.4
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 (§ 380.12(e)(5)). See § 380.13(b) for consultation requirements. Any surveys required through § 380.13(b)(5)(I) must have been conducted and the results included in the application.	Section 3.5 (Survey reports will be provided when completed)
7. Identify all federally listed essential fish habitat (EFH) that potentially occurs in the vicinity of the project and the results of abbreviated consultations with NMFS, and any resulting EFH assessment. (§ 380.12(e)(6))	Section 3.2.2.2
8. Describe any significant biological resources that would be affected. Describe impact and any mitigation proposed to avoid or minimize that impact. (§ 380.12(e)(4&7)) For offshore species be sure to include effects of sedimentation, changes to substrate, effects of blasting, etc. This information is needed on a mile-by-mile basis and will require completion of geophysical and other surveys before filing.	Sections 3.2.3, 3.2.4, 3.3.2, 3.3.4, 3.4.3, 3.4.5, and 3.5
Additional Information Often Missing and Resulting in Data Requests	
9. Provide copies of correspondence from federal and state fish and wildlife agencies along with responses to their recommendations to avoid or limit impact on wildlife, fisheries, and vegetation.	Appendix 1-K of Resource Report 1

Resource Report 3 Filing Requirements	
Information	**Location in Resource Report**
10. 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.	Section 3.3.2 and 3.3-2
11. 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.	Section 3.3.4
12. For aquatic and marine species, be sure to include effects of sedimentation, changes to substrate, effects of blasting, etc. This information may be needed on a location-specific (i.e., milepost) basis and may require geophysical and other surveys. Results of such surveys and analyses should be included in the application.	Section 3.2.4

DRAFT RESOURCE REPORT 3
FISH, WILDLIFE, AND VEGETATION

TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

DRAFT RESOURCE REPORT 3
FISH, WILDLIFE, AND VEGETATION

LIST OF ACRONYMS AND ABBREVIATIONS

ACJV	Atlantic Coast Joint Venture
ATWS	additional temporary workspace
Audubon	National Audubon Society
BCC	Birds of Conservation Concern
BCR	Bird Conservation Region
BGEPA	Bald and Golden Eagle Protection Act of 1940
BMPs	best management practices
CWH	coldwater habitat
DNH	Division of Natural Heritage
E&SCP	Erosion and Sediment Control Plan
ECA	Ecological Core Area
EFH	Essential Fish Habitat
EO	Executive Order
ESA	Endangered Species Act of 1973
°F	Fahrenheit
FERC	Federal Energy Regulatory Commission
HDD	horizontal directional drilling
HUC	hydrologic unit codes
IBA	Important Bird Area
IPaC	Information for Planning and Consultation
MBSC	Migratory Bird Species of Concern
MBTA	Migratory Bird Treaty Act
MOU	memorandum of understanding
MP	milepost
NCDEQ	North Carolina Department of Environmental Quality
NCFS	North Carolina Forest Service
NCNHP	North Carolina Natural Heritage Program
NCWRC	North Carolina Wildlife Resources Commission
NLCD	National Land Cover Database
NMFS	National Marine Fisheries Service
Plan	FERC's May 2013 version of the Upland Erosion Control, Revegetation, and Maintenance Plan
Procedures	FERC's May 2013 version of the Wetland and Waterbody Construction and Mitigation Procedures
Project	MVP Southgate Project
ROW	right-of-way
SPCC Plan	Spill Prevention, Containment, and Countermeasure Plan
U.S.	United States
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

VDCR	Virginia Department of Conservation and Recreation
VDGIF	Virginia Department of Game and Inland Fisheries
WWH	warmwater habitat

DRAFT RESOURCE REPORT 3
FISH, WILDLIFE AND VEGETATION

3.1 INTRODUCTION

Mountain Valley Pipeline, LLC ("Mountain Valley") is seeking a Certificate of Public Convenience and Necessity ("Certificate") from the Federal Energy Regulatory Commission ("FERC" or "Commission") pursuant to Section 7(c) of the Natural Gas Act to construct and operate the MVP Southgate Project ("Project"). The Project will be located in Pittsylvania County, Virginia and Rockingham and Alamance counties, North Carolina. The Project proposes to construct approximately 72 miles of 24-inch-diameter natural gas pipeline (known as the H-650 pipeline) to provide timely, cost-effective access to new natural gas supplies to meet the growing needs of natural gas users in the southeastern United States ("U.S."), including for the Project's anchor shipper, a local distribution company serving customers in North Carolina. See Resource Report 1 (General Project Description) for additional Project information.

3.1.1 Environmental Resource Report Organization

Resource Report 3 is prepared and organized according to the FERC Guidance Manual for Environmental Report Preparation (2017). Section 3.2 of this report describes the fishery resources associated with the waterbodies crossed by the Project, Section 3.3 describes the wildlife habitat in the Project area including compliance with the provisions of the Migratory Bird Treaty Act ("MBTA") and Bald and Golden Eagle Protection Act ("BGEPA"), Section 3.4 describes the existing vegetation resources in the Project area, and Section 3.5 describes the federally-protected and state-protected species that are known to occur or potentially occur in the Project area. All sections identify existing resources, potential Project effects on those resources, and measures to avoid, minimize or mitigate potential Project effects. A checklist showing the status of the FERC filing requirements for Resource Report 3 is included following the Table of Contents.

3.2 FISHERIES RESOURCES

Fisheries resources are broadly defined as fishes and aquatic invertebrates, including mollusks. Fishery resources are typically found within perennial waterbodies; however, depending on their proximity and flow characteristics, intermittent or ephemeral streams may be used by fishery resources when water is present. The Project coordinated with the United States Fish and Wildlife Service ("USFWS"), Virginia Department of Game and Inland Fisheries ("VDGIF"), Virginia Department of Conservation and Recreation ("VDCR") – Division of Natural Heritage ("DNH"), North Carolina Natural Heritage Program ("NCNHP") and North Carolina Wildlife Resources Commission ("NCWRC") to identify fishery resources in the Project area.

3.2.1 Fisheries Habitat Classification

A fishery is generically defined as a system in which the aquatic biota, aquatic habitat, and human users of these renewable resources interact and influence the system's performance (Lackey, 2005). Surface water areas provide suitable habitat for aquatic life and are categorized according to water temperature (warmwater or coldwater), salinity (freshwater, marine, or estuarine), fish harvest (commercial or recreational), upstream areas for spawning marine fishes (anadromous species), and migration routes from

freshwater to marine waters for reproduction (catadromous species). FERC defines significant fishery resources as waterbodies that either (1) provide important habitat for foraging, rearing, or spawning; (2) represent important commercial or recreational fishing areas; or (3) support large populations of commercially or recreationally valuable fish species or fish species that are protected at the federal, state, or local level.

Fishery resources are found in a variety of waterbodies that occur in the Project area and range from large river systems to small streams. Refer to Section 2.3 of Resource Report 2 for additional information regarding the waterbodies crossed by the Project. Proposed waterbody crossings including access roads and construction workspaces are depicted on the Project alignment sheets and U.S. Geological Survey topographic map excerpts provided in Appendix 1-A of Resource Report 1.

All surface waters crossed by the Project are designated as freshwater habitats. Freshwater systems have low salinity (less than 0.5 ppt) and contain fisheries that are typically classified as either warmwater habitat ("WWH") or coldwater habitat ("CWH"). This designation is dependent upon the dominant species of fish occupying the waterbody based on the regime of water temperatures through the year as well as other physical characteristics. CWH fisheries support fishes that spawn in water temperatures between 40 and 60° Fahrenheit ("°F"), prefer clear, cold waters, are not tolerant of extreme temperature changes, and cannot survive for long periods with water temperatures above 68 °F (Piper et al., 1982). CWH fish species include trout and their associated foraging communities (i.e., mayflies, caddisflies, and stoneflies). WWH fisheries support fishes able to tolerate water temperatures above 80 °F including recreational gamefish species such as sunfish (*Centrarchidae*) and catfish (*Ictaluridae*).

Based on publically available data, no CWH waterbodies are crossed or affected by the proposed Project. Consultations with agencies are ongoing to confirm that all surface waters crossed by the Project are considered WWH.

3.2.2 Existing Fishery Resources

Appendix 2-A of Resource Report 2 lists the waterbodies crossed by the proposed Project facilities and associated access roads and includes the state water quality and designated usage classifications.

3.2.2.1 Aquatic Species Occurring Near the Project

The U.S. is divided and sub-divided into successively smaller hydrologic unit codes ("HUC") that are classified into four levels and HUCs: regions (HUC 2), sub-regions (HUC 4), basins (HUC 6), and sub-basins (HUC 8). Sub-basins are further divided into watersheds (HUC 10). The Project is located within the U.S. Geological Survey ("USGS") designated 03-South Atlantic-Gulf Region (USGS, 2018). In Virginia, the Project will cross the Roanoke and Yadkin Rivers Basin, three sub-basins and five watersheds (Virginia Department of Environmental Quality [VDEQ], 2018). In North Carolina, the Project will cross the Roanoke River Basin and the Cape Fear River Basin, three sub-basins and five watersheds (North Carolina Department of Environmental Quality [NCDEQ], 2018). Table 2.3-1 in Resource Report 2 identifies these major regions and their respective sub-basins by 8-digit HUC and watershed by 10-digit HUC. As all waters crossed are considered WWH and the waters drain to the Atlantic Ocean, the aquatic fauna is relatively consistent across the Project area.

In Virginia, more than 300 fish species and approximately 45 mussel species are known to occur with several fish species and over 60 percent of the mussel species listed as federally- or state-endangered, threatened, or special concern. In North Carolina, more than 200 fish species and over 60 mussel species are known to occur; several of the fish species and over 50 percent of the mussel species are listed as federally- or state-endangered, threatened, or special concern. Of these listed species, two fish species and five mussel species have been identified to potentially be present near the Project (see Section 3.5 for detailed information on listed species). Table 3.2-1 (see Tables Section) shows a representative list of fish species within the Project area.

Amphibians have unique physiologies and life histories completely dependent on the local aquatic environment. Their distribution across the landscape often depends on the moisture, humidity, and temperature of the local environment. Virginia is home to 21 frog species and 49 salamander species and North Carolina is home to 31 frog species and 63 salamander species, some of which are afforded state or federal protection (VDGIF, 2018a and NCWRC, 2018a). Through initial agency consultations, the Project identified two state-special concern species of salamander with potential to occur near the Project (Table 3.5-1). Consultation regarding these species is ongoing, see Section 3.5 for additional information.

Over 50 species of crayfish occur in Virginia and North Carolina, with eight considered rare or imperiled by the VDCR-DNH and nine species considered species of special concern in North Carolina (VDGIF, 2018a and NCWRC, 2018a). Through initial agency consultations, the Project identified two crayfish species, one state special concern and one significantly rare, with potential to occur near the Project. Consultation regarding these species is ongoing, see Section 3.5 for additional information.

3.2.2.2 Essential Fish Habitat

The 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act set forth a new mandate for the National Marine Fisheries Service ("NMFS"), regional fishery management councils, and other federal agencies to identify and protect important marine and anadromous fish habitats. This mandate is addressed through the establishment of "essential fish habitat" ("EFH") for federally managed species. The Magnuson-Stevens Fishery Conservation and Management Act (Public Law 94-265 as amended through October 11, 1996) defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity."

According to the NMFS online EFH Mapper tool (NMFS, 2017), the Project does not cross any waterbodies identified as EFH. Because the Project is located well inland of saltwater and tidal waters and does not cross known anadromous or diadromous fish migration routes, none of the waterbodies crossed by the Project contain, or have the potential to support, species managed by the NMFS.

3.2.2.3 State Fisheries

Virginia and North Carolina have developed individual guidelines and regulatory systems for evaluating, classifying, and monitoring surface waters. These classifications are described in detail as part of Resource Report 2. As part of these classifications, Virginia and North Carolina have designated high quality habitat waterbodies with potential to provide suitable habitat for protected species. The classifications pertaining to potential presence of fisheries of special concern or associated habitat, are explained in the following sections.

Virginia

Tier Designation

Virginia Department of Environmental Quality recognizes and classifies exceptional state waters, which warrant protection to maintain high water quality for the benefit of future generations. The state establishes a tiered, anti-degradation policy and implementation procedure to maintain and protect existing water quality in Virginia waters. The higher the tier designation (I-III), the greater the protection awarded. Tier I and Tier II waters are not considered special protection waters. Waters designated as Tier III are known as "outstanding national resource waters" by the U.S. Environmental Protection Agency ("USEPA") and "exceptional state waters" in Virginia. These waterbodies must meet any or all of the following criteria: 1) location of outstanding scenic beauty, 2) possess exceptional aquatic communities, or 3) have superior recreational opportunities. No Tier III Waters are crossed by the Project, therefore no impacts to exceptional aquatic communities will occur as a result of construction or operation of the Project.

Trout Waters

The VDGIF has identified a classification system for potential trout waters based on aesthetics, productivity, resident fish population and waterbody structure. Per VDGIF Regulation 9 VAC25-260-370, waterbodies with classifications of i through iv are indicative of wild trout habitat and classifications of v through viii indicate cold water habitat not suitable for wild trout but adequate for year-round hold-over of stocked trout. No wild trout or stocked trout waterbodies (classes i through viii) are crossed by the Project, therefore no impacts are expected to trout waters.

North Carolina

Outstanding Resource Waters

Per the North Carolina Surface Water and Wetland Standards, to be classified as Outstanding Resource Water, a waterbody must exhibit one or more of the following values or uses to demonstrate it is of exceptional state or national recreational or ecological significance: (1) there are outstanding fish (or commercially important aquatic species) habitat and fisheries; (2) there is an unusually high level of water-based recreation or the potential for such recreation; (3) the waters have already received some special designation such as a North Carolina or National Wild and Scenic River, Native or Special Native Trout Waters or National Wildlife Refuge, which do not provide any water quality protection; (4) the waters represent an important component of a state or national park or forest; or (5) the waters are of special ecological or scientific significance such as habitat for rare or endangered species or as areas for research and education. No surface waters crossed by the Project have been classified as Outstanding Resource Water, therefore no impacts are anticipated to these waterbodies.

Trout Waters

North Carolina utilizes supplemental classifications for surface waters with potential to harbor trout populations. Per the North Carolina Surface Water and Wetland Standards, trout waters are freshwaters protected for natural trout propagation and survival of stocked trout. No surface waters with trout-water classification are crossed by the Project, therefore no impacts are expected to these fisheries.

3.2.2.4 Commercial Fisheries

Commercial fishing is allowed in both Virginia and North Carolina, as both states are bordered by estuarine and marine environments. The Virginia Marine Resources Commission and the North Carolina Division of Marine Fisheries are the respective State agencies commissioned to manage and regulate marine resources. In both states, commercial fishing activities are primarily restricted to marine, estuarine and diadromous species habitats. The Project will not cross waterbodies that support commercial fisheries; therefore it will have no impact on commercial fishing in Virginia or North Carolina.

3.2.2.5 Recreational Fisheries

Recreational fishing in all environments (i.e., marine, estuarine, and freshwater) provide economic and conservation benefits to Virginia and North Carolina. In 2011, retail sales associated with recreational fishing totaled $1.1 billion in Virginia and $1.4 billion in North Carolina (USFWS and U.S. Census Bureau, 2014). Any impacts on recreational fisheries associated with construction of the Project facilities will be minor and temporary; therefore no permanent impacts are anticipated on recreational fisheries from the Project.

3.2.3 Fisheries of Special Concern

Waterbodies with fisheries of special concern include those that have fisheries with important recreational value, support coldwater fisheries, are included in special state fishery management regulations, or provide potential habitat for federally or state-listed threatened or endangered species. Waterbodies that have significant economic value because of fish stocking programs, commercial fisheries, EFH or tribal harvest are also considered a fishery of special concern. As previously described, there are no trout waterbodies, no areas of EFH, no CWH fisheries, and no commercial fisheries located in the Project area. Therefore, fisheries of special concern in the Project area are based largely on potential presence of threatened or endangered species (see Section 3.5 for a discussion of threatened or endangered species).

During initial consultation, agencies provided information on streams that potentially support federally- or state-listed threatened, endangered, or candidate species and their habitat (see Appendix 1-K of Resource Report 1). Suites of species identified during consultation include fish, mussels, salamanders and crayfish. Table 3.5-1 (see Tables Section) lists these species and their regulatory status. Fisheries of special concern crossed by the proposed Project are listed in Table 3.2-2. Potential project effects on fishery resources, including fisheries of special concern, are discussed in Section 3.2.4.

3.2.4 Construction and Operation Impacts and Mitigation

3.2.4.1 Proposed Pipeline

This section describes potential impacts and associate mitigation measures that the Project may implement to minimize impacts on fisheries and other aquatic resources within waterbodies crossed or affected by the Project.

Potential short-term impacts on fisheries and other aquatic resources associated with pipeline construction activities may be caused by temporary increases in sedimentation and turbidity, alteration or removal of aquatic habitat cover and vegetation on adjacent banks, direct contact by construction equipment with food resources in the form of relatively immobile prey, introduction of pollutants, or entrainment of fish.

However, no long-term effects on dissolved oxygen, pH, benthic invertebrates, or fish communities are expected to occur due to the construction or operation of the Project facilities. Specific impact avoidance or minimization measures that may be used on the Project include:

- Adopt the FERC's *Upland Erosion Control, Revegetation, and Maintenance Plan* ("Plan") and *Wetland and Waterbody Construction and Mitigation Procedures* ("Procedures") (May 2013 versions) and develop a Project-specific Erosion and Sediment Control Plan ("E&SCP") that will outline best management practices ("BMPs") to avoid increasing sedimentation of downstream habitats and to minimize impacts on fishery resources.
- Employ one environmental inspector per construction spread, per the FERC Procedures. Additional environmental inspectors may be assigned to each construction spread based on the length of the spread and the number of, and significance of resources affected.
- Adhere to time of year restrictions near sensitive waterbodies to the extent practicable. If adherence to time of year restrictions is not possible, notification will be provided on a case-by-case basis to the applicable agency with a request for a modification or waiver of the timing restriction. These efforts will minimize the potential for Project-related impacts to the fish spawning, recruitment, ecology, and populations.
- Conduct construction at stream crossings during low flow conditions, to the maximum extent possible.
- Cross streams using dry-ditch crossing methods by pumping or fluming water around the work area if water is flowing at the time of construction.
- Expedite construction within waterbodies effectively reducing disturbance to the streambed and adjacent soils and the quantity of suspended sediments.
- Conduct pipeline assembly in upland areas unless crossing a wetland and it is dry enough to adequately support skids and pipe. Timber mats will be used to cross wetlands.
- Minimize the length of time that the trench is open, to the maximum extent practicable, especially within wetlands.
- Reduce the construction right-of-way ("ROW") width to 75 feet at stream and wetland crossings where possible.
- Clearly mark boundaries and buffers to be avoided in the field with signs and/or highly visible flagging until construction-related ground disturbing activities are complete.
- Restrict clearing of trees and other vegetation to only what is necessary to safely construct and operate the Project.
- Avoid removal of riparian canopy or stabilizing vegetation, if possible. Crushing or shearing streamside woody vegetation is preferable to complete removal.
- Restore streambeds and banks to preconstruction conditions to the extent practicable. Promptly remove construction materials and related crossing structures from each waterbody after construction.

- Use native stone to the extent possible during stream bed restoration and stabilization.
- Stabilize waterbody banks and install sediment barriers within 24 hours of completing in-stream construction activities. Sediment barriers will be left in place until the site has been stabilized with perennial vegetation.
- Install temporary equipment bridges within the RIGHT-OF-WAY to reduce turbidity and sedimentation caused by construction and vehicular traffic.
- Allow vegetation in wetlands to recover more rapidly by only removing tree stumps located directly over the trench line or where safety is a concern.
- Adhere to the Spill Prevention, Containment, and Countermeasure ("SPCC") Plan.
- Prohibit construction equipment, vehicles, hazardous materials, chemicals, fuels, lubricating oils, and petroleum products from being parked, stored, or serviced within a 100-foot radius of wetlands or waterbodies unless the environmental inspector finds, in advance, no reasonable alternative and the Project and its contractors have taken appropriate steps (including secondary containment structures) to prevent spills and provide for prompt cleanup in the event of a spill. All equipment will be inspected for leaks by an inspector at the beginning of the day. Operation will not commence or will cease until the spill is contained, cleaned up, and collected before operations continue. Leaking equipment will be removed or repaired the same day.
- Maintain the permanent easement predominantly with mechanized clearing. Herbicide treatments will be used only for control of invasive species, as necessary.
- Implement sustainable water-use practices to ensure water resources and environmentally responsible stream flows are maintained during water withdrawal activities. All water withdrawals will be performed in accordance with applicable local, state and/or federal regulations to prevent the localized and downstream dewatering of streams and minimize impacts to aquatic species.
- Utilize floating, appropriately sized screened intakes to prevent crushing, entrainment, or entrapment of mussels and fishes.

Restoration, bank stabilization, and revegetation efforts, which are defined in the FERC Plan and Procedures, will minimize the potential for erosion from the surrounding landscape. Adherence to the FERC Plan and Procedures and the Project's E&SCP will also maximize the potential for regrowth of riparian vegetation, thereby minimizing the potential for long-term impacts associated with lack of shade and cover.

Waterbodies crossed by the pipeline in areas of shallow bedrock are listed in Table 2.3-7 of Resource Report 2. Blasting during trench excavation across waterbodies may be required and can result in impacts to fisheries due to the repercussive effects travelling through water (Yelverton et al., 1975; Munday et al. 1986; Kolden and Aimone-Martin, 2013). Injuries incurred by fish exposed to pressures from blasting include eye distension, multiple hemorrhages, hematuria (blood in the urine), and damage to a variety of systems (Hastings and Popper, 2005; Godard et al., 2008; Carlson et al., 2011; Martinez et al., 2011). Higher mortality has been found in fish that are smaller, closer to the blast, and at higher water depths (Yelverton et al., 1975; Munday, 1986). The Project will avoid or minimize blasting in waterbodies to the

extent practicable by using other means of rock removal where bedrock is encountered within trench depth. If blasting is necessary, it will occur after the work area has been isolated from waterbody flow to minimize impacts on fisheries. The Project continues to evaluate the potential need for blasting and is working to prepare and implement a Project-specific blasting plan, if necessary, and will coordinate with the applicable federal and state agencies. See Resource Report 6 for more detail on blasting.

[Note: The Project continues to prepare its Blasting Plan for the MVP Southgate Project. Additional information will be provided in the final Resource Reports included with the Certificate application expected to be filed in November 2018.]

3.2.4.2 Proposed Aboveground Facilities and Access Roads

None of the aboveground facilities are located within riparian zones known to harbor sensitive aquatic species. Construction activities associated with aboveground facilities will adhere to both the FERC Plan and Procedures and the Project-specific E&SCP, as applicable. Therefore, no impacts to fisheries or aquatic resources are anticipated associated with the construction or operation of the Project aboveground facilities.

To the extent practicable, the Project will use existing access roads (with existing waterbody crossings) for the Project. These roads include existing farm roads or roads that have previously been used for other construction activities. If installation of a new or an improved existing waterbody crossing is required, the crossing will be completed in accordance with the FERC Plan and Procedures as well as applicable regulatory performance standards and approvals.

3.2.4.3 Waterbody Construction Methods

As a voluntary minimization measure, the Project will reduce the typical 100-foot workspace to 75 feet at waterbody crossing locations. Waterbody crossing construction methods will vary based on the characteristics of the waterbody and will be performed in accordance with the FERC Procedures. All applicable regulatory approvals will be obtained prior to construction. Methods for construction at waterbody crossings are detailed in Section 1.4.1 of Resource Report 1.

Waterbodies along the Project will be crossed by utilizing dry crossing methods. Construction across waterbodies will be performed in accordance with timing restrictions defined in the FERC Procedures unless otherwise approved by FERC. The pipeline will be installed to provide a minimum of three feet of cover from the waterbody bottom to the top of the pipeline, except in consolidated rock, where a minimum of two feet of cover will be required.

Avoidance of streambed and riparian area disturbance can be achieved by implementation of trenchless construction methods including conventional bore or horizontal directional drilling ("HDD"). Refer to Section 1.4.1.1 of Resource Report 1 for additional information regarding these waterbody crossing methods. The Project is currently proposing to employ the HDD method to complete two crossings (Dan River and Stony Creek Reservoir). The Project is also currently evaluating conventional boring to complete three crossings (Wolf Island Creek, Cascade Creek, and Deep Creek).

Temporary construction bridges will be used during all phases of construction to allow construction equipment to cross waterbodies. The FERC Procedures allow clearing equipment and equipment necessary for the installation of temporary bridges to cross each waterbody once prior to bridge installation. Temporary bridges will be needed from initial ROW clearing through final restoration, so the bridges will

remain in place even when in-stream construction is not occurring. However, use of the bridges by construction vehicles will prevent turbidity and sedimentation impacts otherwise caused by vehicles directly crossing the streambed.

3.2.4.4 Vegetation Clearing

Removal of trees and other riparian vegetation from the edges of waterbodies at the crossing may reduce shading of the waterbody, diminish escape cover, and can result in locally elevated water temperatures. Elevated water temperatures can, in turn, lead to reductions in levels of dissolved oxygen. This can negatively influence habitat quality and reduce availability of habitat for certain fish species. The Project attempted to minimize impacts resulting from tree clearing by routing the proposed pipeline adjacent to existing cleared rights-of-way, previously developed corridors and open lands where possible.

To further minimize potential impacts associated with loss of riparian shade and vegetation cover, clearing of trees and other vegetation will be restricted to only what is necessary to safely construct and operate the proposed pipeline. Once construction is complete, streambeds and banks will be restored to preconstruction conditions to the extent practicable. Restoration, bank stabilization, and revegetation efforts, which are defined in the FERC Procedures, will minimize the potential for erosion into waterbodies from the surrounding landscape. Adherence to the FERC Procedures will also maximize the potential for re-growth of riparian vegetation, thereby minimizing the potential for long-term impacts associated with lack of shade and cover.

Implementation of the FERC Procedures during construction will minimize the short-term impacts on fishery resources and the aquatic habitats upon which these fishery resources depend. After construction, invertebrate populations will recolonize the crossing area and temporary workspaces will revert to their original condition, including re-establishment of riparian cover. For rapidly-reproducing species or assemblages of insects, recovery may be as quick as a few months (Mattaei and Townsend, 2000) or even within weeks or days, depending on stream substratum (Brooks and Boulton, 1991). Recolonization of invertebrate species that do not have an aerial adult stage will require longer periods of time than those with a winged, terrestrial adult stage (Wallace, 1990). Operation and routine maintenance of the proposed pipeline ROW and aboveground facilities will be restricted to clearing and mowing vegetation within the permanent rights-of-way, which is not anticipated to have an adverse impact on fishery resources crossed by the Project.

The Project will limit the amount of vegetation cleared between the waterbody and the additional temporary workspaces ("ATWS"). Crossings will be aligned as close to perpendicular to the axis of the waterbody channel as engineering and routing conditions allow. ATWS areas are typically located at least 50 feet away from the water's edge unless safety and constructability necessitates the ATWS to be closer, in which case the Project will request a variance from the FERC Procedures. If the proposed pipeline alignment parallels a waterbody, the Project will maintain at least 15 feet of undisturbed vegetation between the waterbody (and any adjacent wetland) and the construction ROW. Implementation of the FERC Plan and Procedures will minimize short- and long-term water quality impacts within the waterbodies crossed by the proposed pipeline.

3.2.4.5 Spill Prevention and Control

Accidental spills of construction-related fluids (i.e., oil, gasoline, or hydraulic fluids) on the landscape or directly into waterbodies could result in water quality impacts affecting fish and other organisms. Impacts to fisheries would depend on the type and quantity of the spill and the dispersal and attenuation characteristics of the waterbody. These impacts can be avoided by proper management and care of hazardous fluids during construction. Management and care of hazardous materials and fluids will be addressed in the Project's SPCC Plan. The implementation of the SPCC Plan will avoid or minimize the potential for adverse effects on aquatic species from the accidental or unintended release of contaminants. To avoid or minimize spill risk during construction, refueling or other handling of hazardous materials will not occur within 100 feet of wetland and waterbody resources unless the environmental inspector determines that no other alternative is feasible and the appropriate steps to prevent spills had been taken. This may include dewatering pumps and HDD equipment where applicable. Individual SPCC Plans will be prepared and implemented for each aboveground facility and contractor yard that stores oil in excess of the volumes identified in 40 CFR § 112 to protect surface water resources.

[Note: The Project continues to prepare its general SPCC Plan for the MVP Southgate Project. Additional information will be provided in the final Resource Reports included with the Certificate application expected to be filed in November 2018.]

3.2.4.6 Aquatic Non-Native/Invasive Species

To reduce the risk of spreading aquatic invasive species, the Project will implement measures in the FERC Plan and Procedures. This includes employing one environmental inspector per construction spread who is adequately trained in field identification of invasive plant species to ensure equipment is free of debris before being transported to a new construction spread through use of designated equipment cleaning stations.

3.3 WILDLIFE

This section describes the wildlife resources potentially affected by the construction and operation of the proposed Project. Wildlife and habitat types typically found in the Project area and methods used to avoid and minimize impacts on these resources are described below.

3.3.1 Existing Resources

The wildlife species that occur in the vicinity of the Project are representative of the vegetation community structure and composition of the terrestrial and wetland habitats present within the Piedmont region. The composition, structure and distribution of the plant community in an area are referred to as the vegetative cover. Existing plant communities, as well as aspects of the physical environment (i.e. climate, microclimate, hydrology, and geology) will influence the wildlife species that are present in a particular habitat. This section describes major wildlife habitat types and wildlife species associated with vegetative cover types present in the Project survey corridor (see Section 3.4.2 for descriptions of plant communities present in the Project area).

Dominant wildlife habitat types have been identified along the proposed pipeline route and at aboveground facility locations based on field surveys and review of available resource material. These habitat types include upland forest, open uplands (early successional scrub-shrub and herbaceous vegetation cover),

forested wetlands, scrub-shrub wetlands, emergent wetlands, agricultural, urban and open water habitats. Wetland habitat types are further described in Section 2.4.2 of Resource Report 2.

Each of these habitat types support a diversity of wildlife with species potentially found in the Project area. Potential wildlife species in each habitat type was determined by accessing information provided by the state agencies (VDGIF, 2018a and NCWRC, 2018), knowledge of common wildlife species provided by biologists familiar with the Project area and species observed during the ongoing survey efforts. Table 3.3-1 shows a representative list of general wildlife species that may occur within the Project area (see Tables Section).

3.3.2 Significant or Sensitive Wildlife Habitat

Based on database searches and agency consultation, no proposed Project facilities are located within USFWS National Wildlife Refuges or other federally-protected lands (see Agency Consultations [Appendix 1-K of Resource Report 1] and USFWS, 2018a). The Project avoided impacts to federally-significant and sensitive wildlife habitat to the extent practicable. The proposed pipeline route intersects several private and state-managed conservation lands. Table 3.3-2 (see Tables Section) lists the private and state-managed conservation lands that are within one mile of the Project as identified using the information provided by the consulting agencies. The private and state-managed lands that intersect with the proposed construction area of the Project are located along the edge of existing ROWs and are outside of high quality habitat.

3.3.3 Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act

The MBTA of 1918 (16 U.S. Code 703-711) affords protection to all birds listed in 50 CFR 10.13 (78 FR 65844, 65864). In addition to the MBTA, bald and golden eagles (*Haliaeetus leucocephalus* and *Aquila chrysaetos*, respectively) are protected under the BGEPA of 1940 (16 U.S. Code 668-688d). EO 13186 directs federal agencies to identify where incidental take is likely to have a measurable negative effect on migratory bird populations and to avoid and minimize these adverse effects through enhanced collaboration with the USFWS. Federal Executive Order 13186 states that emphasis should be placed on species of concern, priority habitats, and key risk factors. Particular focus should be given to addressing population-level impacts over individual impacts.

On March 30, 2011, the USFWS and FERC entered into a voluntary Memorandum of Understanding ("MOU") that focuses on avoiding or minimizing adverse effects on migratory birds and strengthening migratory bird conservation through enhanced collaboration between the two federal agencies. The MOU does not authorize the take of migratory birds or waive legal requirements under MBTA, BGEPA, the federal Endangered Species Act ("ESA") of 1973, or any other statutes. However, on December 22, 2017, the Department of the Interior issued a MOU (M- 37050) analyzing whether the MBTA prohibits the accidental or incidental take of migratory birds. In the 2017 MOU (M- 37050), the Department of the Interior clarified their position stating that the MBTA does not prohibit incidental take.

This section details the Project's responsibilities as required under MBTA and BGEPA, and voluntary commitments to conserving migratory birds in the Project area, including:

- Identifying Project-specific Migratory Bird Species of Concern ("MBSC");
- Evaluating impacts to Project-specific MBSC breeding habitat within the Project area; and

- Summarizing strategies to avoid and minimize impacts on Project-specific MBSC and their associated habitats.

3.3.3.1 Migratory Bird Species of Concern

According to the USFWS Birds of Conservation Concern ("BCC") 2008 report (USFWS, 2008a), the most recent effort to carry out this mandate, the Project is located within the Piedmont Bird Conservation Region ("BCR") 29. Each BCR maintains a specific list of BCC that include migratory and non-migratory birds that are of conservation concern and considered species that, without additional conservation measures, may become candidates for the ESA (USFWS, 2008a). BCR 29 lists 18 BCC specific to the Piedmont region and of these, seven species are relatively likely to nest near the Project (see Table 3.3-4 describes the preferred nesting habitat and primary nesting season of project-specific MBSC (see Tables Section).

Additional resources were used to identify sensitive bird species that may be affected by the Project, resulting in a list of 33 unique species known to either winter, migrate, or nest in the region (Table 3.3-3). Such resources include USFWS's Information for Planning and Consultation ("IPaC"); bald eagle online planning tools for Virginia and North Carolina; the Atlantic Coast Joint Venture ("ACJV"); state online databases, and through coordination with state agencies (ongoing), as described below.

USFWS's IPaC system helps users identify resources managed by the USFWS that may be affected by a proposed project (USFWS, 2018e). The Project obtained a preliminary IPaC resource list on July 23, 2018; while the list is considered unofficial and not to be used for consultation, the Project used this list to screen for species of conservation concern associated with populations near the Project (see Appendix 1-K of Resource Report 1). The list identified 10 BCC, with the potential to occur in the proposed Project area. Of these, eight were also identified as BCC in BCR 29. One species, rusty blackbird (*Euphagus carolinus*), does not nest in the region and is excluded from the Project-specific MBSC. The other species, bald eagle, is considered due to the BGEPA. Two additional species, blue-winged warbler (*Vermivora cyanoptera*) and cerulean warbler (*Setophaga cerula*), were excluded because these species are not known to nest in the area.

Bald eagle is included as a Project-specific MBSC due to the protections afforded under the BGEPA. This species was also included in correspondence from NCWRC provided on August 10, 2018, and in the unofficial IPaC resource list (USFWS, 2018e). The USFWS Virginia Field Office's Bald Eagle Map Tool and the Center for Conservation Biology VaEagles Nest Locator Tool (Center for Conservation Biology, 2018) were used to identify known locations of bald eagle nests and concentration areas (USFWS, 2018f). No bald eagle nests or bald eagle concentration areas are near Virginia portion of the Project. The NCNHP online database was reviewed to identify known locations of bald eagle nest buffers. No bald eagle nest buffer is near the North Carolina portion of the Project. The Project is committed to avoiding impacts to bald eagles, and therefore if active nests are discovered within 0.5 mile of Project activities, measures adapted from the USFWS National Bald Eagle Management Guidelines for high disturbance activities and the VDGIF's Bald Eagle Guidelines for Landowners (VDGIF and CCB, 2012) will be implemented. These measures are discussed in Section 3.3.3.3 (Proposed Conservation Measures).

The ACJV is a regional partnership between state, federal, and other organizations that collaborate to restore and sustain bird populations and habitats throughout the Atlantic Flyway. In 2014, the ACJV published their Piedmont BCR 29 Implementation Plan (Watson, 2014), which identifies species of concern in BCR 29 and uses a three-tier framework to rank each by conservation priority status: Highest, indicating species

require immediate conservation measures to recover, maintain, or improve existing populations; High, meaning conservation requires immediate attention, but conservation measures are not as time-sensitive; and Moderate, species with either declining but larger populations relative to Highest and High priority species, subject to less serious threats, or a smaller proportion of the population occuring in BCR 29 (Piedmont). Species with Highest and High priorty status were considered as Project-specific MBSC. The document identifies four and 14 species with 'Highest' and 'High' priority status, respectively, that occur in Piedmont BCR 29. Of these, three 'Highest' priority species and four 'High' priority species were added to the list of MBSC due to potential to nest near the Project. In addition, two 'Moderate' priority species were added to the list of MBSC due to their inclusion as a BCC in other BCRs and the preliminary IPaC resource list.

VDGIF's Virginia Fish and Wildlife Information Service was accessed on July 25, 2018 to identify avian species with conservation concerns with the potential to occur near the Project (VDGIF, 2018b). Six species of greatest conservation need with a tier status of I or II were identified. Only one species, yellow-crowned night-heron (*Nyctanassa violacea*), was identified that was not represented via another resource (e.g., IPaC; BCR 29).

VDGIF's Wildlife Environmental Review Map Service was accessed on July 25, 2018 to identify additional avian resources with the potential to occur near the Project (see Appendix 1-K of Resource Report 1); however, no additional avian resources were identified.

NCNHP's online database was accessed on July 25, 2018 to identify birds with conservation concerns in North Carolina with the potential to occur near the Project (NCNHP, 2018). Three species were included in the results, only one, grasshopper sparrow (*Ammodrammus savannarum*), of which had not been previously identified by another resource.

On August 10, 2018, NCWRC provided comments regarding the Project, including recommendations related to migratory birds (see Appendix 1-K of Resource Report 1). NCWRC expressed concern for active colonial nesting birds (i.e., rookery) and recommended avoiding construction activities within 0.5 mile of any rookery. NCWRC recommended surveys to identify rookeries and bald eagle nests within 0.5 mile of the Project during winter months when deciduous trees have shed their leaves.

To understand potential impacts to migratory birds, online databases and other resources were used to identify species known to breed and nest near the Project because nesting birds are most likely to have population level impacts as a result of construction and maintenance of the Project. The first Virginia Breeding Bird Atlas (VDGIF, 2018b), conducted by VDGIF and Virginia Society of Ornithology between 1985 and 1989, was referenced to evaluate species that may nest near the Project in Virginia. The Carolina Bird Club's Birds of North Carolina website (Carolina Bird Club, 2018) was referenced to evaluate species that may nest near the Project in North Carolina and eBird's online mapping tool (eBird, 2012) was accessed to identify species records near the Project during their respective nesting seasons. Ultimately, 20 species were removed from consideration as Project-specifc MBSC due to species not known to nest in BCR 29 (e.g. rusty blackbird) or having no known nesting records near the project (e.g., cerulean warbler; yellow-crowned night-heron), resulting in 12 remaining Project-specific MBSC (Table 3.3-3).

3.3.3.2 Migratory Bird Habitat

This section describes suitable nesting habitat of Project-specific MBSC, and discusses implications of modifications to migratory bird habitat along the proposed Project route. Habitat impacts are evaluated by comparing the amount of each land cover type present along the Project route before and after construction, and following recovery of temporarily disturbed areas. Table 3.4-1 summarizes the amount of each land cover type that is expected to be affected by the Project (see Tables Section).

Impacts to Project-specific MBSC are dependent on the clearing and modification of land cover. Project-specific MBSC most commonly use the following National Land Cover Database ("NLCD") land covers as preferred nesting habitat: Deciduous Forest; Emergent Hebaceous Wetlands; Evergreen Forest; Grassland/Herbaceous; Mixed Forest; Open Water; Pasture/Hay; Shrub/Scrub; and Woody Wetlands (Jin et. al, 2013 and Homer, 2015). Of the approximate 1,501.2 acres within the project footprint, approximately 429.1 acres of potential migratory bird nesting habitat is within the Project's permanent, operation ROW and will be maintained as non-forested land cover in perpetuity. Of this, approximately 226.5 acres will be permanently converted from forested land cover to non-forested land cover. Migratory bird habitat within the temporary ROW associated with construction activities is expected to return to pre-construction conditions (e.g., Pasture/Hay land cover will return to Pasture/Hay following construction). Duration of recovery of vegetation to pre-construction conditions varies based on habitat type with early successional habitat (e.g., Grassland/Herbaceous; Pasture/Hay) returning to pre-construction conditions sooner, often after only a few growing seasons, than forests. Implementing restorative measures outlined in the FERC Plans and Procedures will expedite recovery of vegetation.

Areas that may serve as important habitat for migratory birds were reviewed by the Project. The Important Bird Areas ("IBA") Program is a global initiative developed through Birdlife International to identify and conserve critical areas associated with birds and other biodiversity. The National Audubon Society ("Audubon") serves as the U.S. Partner of Birdlife International to administer the IBA Program in the U.S. From approximate milepost ("MP") 22.7 to MP 25.7, the Project traverses the Virginia Piedmont Forest Block Complex IBA, as identified through review of the Audubon IBA mapping database (Audubon, 2018a).

The NLCD was reviewed to assess the amount of available forest within the Virginia Piedmont Forest Block Complex IBA and the amount that will be permanently removed as a result of the Project (Homer, 2015). In total, the Virginia Piedmont Forest Block Complex IBA contains over 5 million acres of land. Approximately 40 percent of the land within the entire IBA is classified as forested land cover (approximately 2,028,513 acres). The review indicates approximately 15,567 acres of forest (i.e., Deciduous, Mixed, and Evergreen Forest) are available in the individual block of the Virginia Piedmont Forest Block Complex IBA crossed by the Project. The Project is expected to convert approximately 26.1 acres of forest cover to nonforested cover within this block. Project implementation would result in 0.2 percent decrease in available forest cover within the block crossed by the Project; therefore the decrease in forest cover within the Virginia Piedmont Forest Block Complex IBA is unlikely to result in measurable negative effects to migratory birds and their habitat at the population and regional scales.

3.3.3.3 Proposed Conservation Measures

Activities associated with Project implementation have the potential to result in direct and indirect effects to migratory birds. The nesting periods of the Project-specific MBSC species have been identified and will

be confirmed with USFWS. Construction activities occurring during the nesting season of these species could result in incidental take of migratory birds. Some potential effects caused by Project construction may include habitat loss, disruption in foraging activities, and destruction or abandonment of active nests. The proposed construction areas represent a small portion of the available nesting habitat within the immediate vicinity. The Project will implement measures during Project development, construction, and operation, as applicable, to limit effects to migratory birds. Proposed conservation measures (described below) are based on those described in USFWS's Nationwide Conservation Measures, USFWS National Bald Eagle Management Guidelines, VDGIF Bald Eagle Guidelines for Landowners, and the FERC Plan and Procedures.

- Conduct vegetation clearing outside of peak MBSC breeding season.

  The Project intends to clear trees outside of peak MBSC breeding season. Should a significant delay to the start of construction occur, then incidental take may occur; however, as explained by the U.S. Department of the Interior in M- 37050, issued December 22, 2017, the MBTA does not prohibit incidental take. If this situation occurs, the Project will work with USFWS to determine appropriate voluntary conservation measures to minimize impacts to the greatest extent practicable. While the nesting season is generally considered April 1 to August 31, the majority (eight of 12) of Project MBSC do not begin nesting until May.
- Minimize loss or degradation of migratory bird habitat during construction
  - Approximately 68.6 percent of temporarily impacted land cover is expected to return to pre-construction conditions (see Table 3.4-1 for the vegetation impact table).

    The 2011 NLCD was used to assess potential impacts to land cover types important to migratory birds (see Table 3.4-1). Deciduous Forest in the operational footprint will be permanently converted to non-forested land cover, however, upland/herbaceous (including Pasture/Hay), in most cases, will return to pre-construction conditions.
  - The proposed construction areas represent a small portion of the available nesting habitat within the vicinity.

    NLCD was used to evaluate the amount of available forested habitat within 0.6-mile of the Project (Homer, 2015). This distance was used to reflect a buffer at which noise impacts would not disrupt nesting behavior. Approximately 21,759.6 acres of Deciduous Forest is available within 0.6-mile of the Project. Permanent modifications to the landscape as a result of the Project would result in a 0.8 percent decrease in available Deciduous Forest within 0.6-mile of the Project. This decrease is unlikely to result in population-level impacts to any of the Project-specific MBSC that use Deciduous Forest.
  - Currently, 47 percent (34 mi) of the proposed route is collocated with existing ROW, or previously disturbed lands.

    Collocation avoids removing and fragmenting forested habitat, which is the land cover most commonly used by nine of 12 Project-specific MBSC. Due to the routine vegetation maintenance (e.g., mowing) required to operate the ROW, vegetation occurring in the ROW is best described as open habitat (e.g., Grassland/Herbaceous; Pasture/Hay), Shrub/Scrub, or early successional forest. While potential nesting habitat occurs in the

ROW, differences between the vegetation clearing associated with construction of the pipeline and routine vegetation maintenance are likely neglible. Depending on the desired vegetation cover and structure, vegetation typically associated with the ROW is regenerates relatively quickly following disturbance (one to two growing seasons).

- The ROW width is reduced from 100 feet to 75 feet at stream and wetland crossings where feasible.

  Water resources are an important element of migratory bird habitat. Two Project-specific MBSC occupy wetlands as nesting habitat. Others, such as Kentucky warbler (*Geothlypis formosa*), often select other land cover types adjacent streams, rivers, and wetlands due to the vegetative structure created as a result of proximity to these waterbodies. The reduction in workspace results in a corresponding reduction of Project-related impacts on aquatic and wetland breeding habitat.

- Avoid impacts to bald eagles. If active nests are discovered, the following measures adapted from the USFWS National Bald Eagle Management Guidelines and VDGIF Bald Eagle Guidelines for Landowners will be implemented:
  - Blasting or any use of explosives will not occur within 0.5 mile (or within one mile in open areas) of an active nest during the nesting season, considered as December 15 through July 15 for the Project area;
  - Maintain a minimum buffer of 660 feet between Project-related activities and active nests;
  - Restrict all vegetative clearing and ground disturbance within 660 feet of active nests to outside the nesting season; and
- Maintain established landscape buffers between the active nest and Project activities. The Project is committed to avoiding impacts to colonial nesting birds, and therefore, if rookeries are identified, construction activities will be avoided within 0.5 mile of any rookery from February 15 - July 31.
- Adhere to additional measures described in Section 3.2.4.1, which also benefit MBSC.

3.3.4 Wildlife Impacts and Mitigation

Temporary wildlife impacts are those associated with disturbance activities during Project construction, whereas permanent impacts are associated with conversion of forested habitats to scrub-shrub or herbaceous habitats as a result of recurring maintenance of the permanent ROW. Indirect, short-term impacts to wildlife associated with construction noise and increased human activity are expected to be temporary, and could result in abandoned or delayed reproductive efforts, displacement from the Project area, and complete avoidance of active work areas. Direct mortality to less mobile species of small wildlife could occur during clearing and grading operations. Specifically, wildlife could be crushed while on the surface or, in the case of subterranean species, while underground when tunnels or burrows are collapsed due to heavy equipment directly aboveground. Excavated trenches left open during Project construction risk wildlife accidentally becoming trapped or possibly experiencing bodily injury after falling into the trench.

Effects on non-forested habitat impacted during construction will be temporary, and these areas are expected to recover quickly once construction is completed and restoration is initiated. The temporary effects on these habitats will have little or no long-term impact on individual wildlife species or wildlife

populations. Temporary loss of herbaceous cover during the construction and installation of the proposed pipeline will potentially reduce habitat normally utilized by insect pollinators, such as bees and butterflies, or by ground nesting songbirds. By implementing the FERC Plan and Procedures, herbaceous habitat is expected to return to pre-construction conditions.

Forested habitats, both upland and wetland, will be impacted to a greater extent due to the long-term conversion of these wooded habitats to earlier successional stage, grassland/scrub-shrub in the permanent, maintained ROW. Tree removal associated with Project construction will permanently reduce available nesting, roosting, and denning sites for numerous woodland wildlife species. Continuous tracts of forest will be fragmented, and sharp edges created at the interface of intact forest and the permanent ROW will require interior forest wildlife species to relocate to other interior forest areas. New corridors traversing forested tracts may inhibit movement of forest interior species which are more reluctant to cross large openings to due to the increased risk of predation (Bennett, 2003).

Interior forest is commonly defined as the area within a forested tract greater than 300 feet from the forest edge. Impacts on interior forested area crossed by the Project in Virginia were determined using data developed for the VDCR's Virginia Natural Landscape Assessment project (VDCR-DNH, 2007). The Virginia Natural Landscape Assessment project is a landscape-scale geospatial analysis used to identify, prioritize, and link natural lands within Virginia. Large patches of natural land with a minimum of 100 acres of interior cover and associated habitat fragments providing connectivity between large patches are collectively referred to as Ecological Core Areas ("ECA"). Each ECA is ranked based on its ecological integrity, with scores classified into five categories: C1 – Outstanding; C2 – Very High; C3 – High; C4 – Moderate; and C5 – General. The proposed Project has been routed to avoid unnecessary impacts to high quality forested areas and has consequently avoided all outstanding, very high, and high forest rankings. The route bisects only one habitat fragment and otherwise forest impacts in Virginia will be along the edges of ECAs in the Moderate or General category. Impacts to these ECAs are not likely to significantly diminish the availability of forest interior within the landscape.

The North Carolina Forest Service ("NCFS") evaluated the forested areas of the state in the Forest Action Plan to analyze the past, current and projected conditions of forest resources. The Forest Action Plan mapped the forested areas using several categories, one of which addresses wildlife habitat, Conserving Working Forest Lands. The Conserving Working Forest Lands includes forested areas that have high values for connectivity with other forests, water quality protection for existing high quality waters, habitat for wildlife, and strong timber markets (NCFS, 2010).

Approximately 60 percent of North Carolina, or 18.6 million acres, is forested (NCFS, 2010). Within the Piedmont region of North Carolina, approximately 51 percent of lands are forested and nearly all land suitable for timber production is privately held (NCFS, 2010). The Forest Action Plan identifies 5,327,626 acres of land considered as Conserving Working Forest Lands in the Piedmont region (NCFS, 2010), of which the Project route is proposed to impact approximately 102.1 acres for the construction of the pipeline facilities and approximately 35.3 acres for the continued operation and maintainence of the pipeline facilities.

The Forest Action Plan discusses the general conditions of the state's forest resources, and identifies goals for forestry management throughout the state. According to the Forest Action Plan, urbanization is increasing while forestland is decreasing, particularly in the Piedmont region where forestland is most vulnerable to encroachment (NCFS, 2010). The Project avoids large urban centers, traveling west of Eden

and Reidsville in Rockingham County, and Burlington and its suburbs in Alamance County. To minimize impacts from loss of forest cover and forest fragmentation, the Project is intentionally collocated with existing utility corridors and other disturbed lands, as described in Section 1.3.1 of Resource Report 1. The construction ROW width is also reduced to 75 feet wide at stream and wetland crossings, where feasible to do so. While the NCFS does not have regulatory authority in the areas solely identified within the Forest Action Plan as Conserving Working Forest Lands, the Project will continue to evaluate the potential impact to forested areas identified as Conserving Working Forest Lands.

On August 10, 2018 the Project received a comment letter from NCWRC that recommended 14 specific locations where minor deviations from the current route would reduce forest fragmentation and riparian impacts at stream crossings (see Appendix 1-K of Resource Report 1). The Project is currently evaluating these recommendations and if feasible, will incorporate revisions into its certificate application.

The permanent, maintained ROW will provide a travel corridor for many wildlife species, such as bats or birds of prey, and may provide food, shelter, and breeding habitat for species which prefer open herbaceous or scrub-shrub early successional habitats to forested habitats. Maintained utility ROWs are often heavily used by many locally important game species such as white-tailed deer and American black bears. Along with implementing restoration measures contained in the FERC Plan and Procedures, the Project is committed to using native seed mixes. Additional consultation with applicable regulatory agencies will be conducted with respect to seed mixes to be used during restoration activities. Furthermore, shrub-like vegetation will be permitted to grow between the maintained ROW and the naturally regenerating forest sections of temporary workspaces to provide a gradual transition from the sharp edge of the pipeline corridor to forested areas. The permanent easement will predominantly be maintained with mechanized clearing. Herbicide treatment will only be used to control for invasive species, as necessary, which allows long term usage of the ROW for pollinators.

3.4 VEGETATION

This section describes the vegetation resources potentially affected by construction and operation of the proposed Project. Included are the descriptions of various plant communities found in the Project area and methods that will be used to minimize Project-related impacts on these vegetation resources.

3.4.1 Ecoregion

The vegetation communities within the Project area are described from a regional perspective using Omernik's Level III Ecoregions, maintained by the USEPA. Ecoregions are areas of similarity based on patterns in the mosaic of biotic (living) and abiotic (not living) components and aquatic and terrestrial ecosystems, including geology, physiography, vegetation, climate, soils, hydrology, land use, and wildlife, with humans being considered as part of the biota (Omernik, 2012). The Project is located entirely within the Piedmont Region.

The Piedmont is generally considered to be the transitional area between the Appalachian Mountains to the northwest and the coastal plain located to the southeast. The region is generally non-mountainous, but still has greater topography than the coastal plain. The soils are generally finer-textured than in coastal plain regions (Level III Ecoregions 63 and 65). The landscape was historically forested, however has been largely cultivated. Many of the agricultural areas have regrown into successional forests.

3.4.2 Existing Vegetation

Vegetation cover types along the Project route were determined by review of aerial photography, existing land use classifications, and field surveys. Descriptions of existing representative vegetation cover types along the Project route are based on the natural community classification system described in the 2011 NLCD developed by the USGS (Jin et al., 2013 and (Homer, 2015). Developed or managed land classes mapped along the Project route consist of agricultural land, industrial, commercial, and residential areas. Major natural vegetation land classes include forested upland, scrub-shrub land, herbaceous upland, and wetlands. The following paragraphs provide a description of NLCD land class along the Project route.

3.4.2.1 Agricultural Land and Silviculture

According to the 2011 NLCD, agricultural land includes pastureland, hay fields, and cultivated crops subclasses. Pastureland and hay fields are characterized as areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20 percent of total vegetation within this subclass.

Cultivated crops are areas used for the production of annual crops, such as corn, soybeans, vegetables, tobacco, and cotton. Cultivated crops also include areas devoted to perennial wooded lands being managed for forest products, i.e., pine plantations, sugar maple stands, or tree nurseries. Crop vegetation accounts for greater than 20 percent of total vegetation within this subclass. This class also includes all land being actively tilled.

3.4.2.2 Forested Upland

The acreage of upland forest that will be impacted during construction and operation of the Project is included in Table 3.4-1 (see Tables Section).

Upland Deciduous Forest

According to the 2011 NLCD, areas of upland deciduous forest are dominated by trees generally greater than 15 feet tall, and contain greater than 20 percent of total vegetation cover. More than 75 percent of the tree species shed foliage simultaneously in response to seasonal change. A variety of upland deciduous forest vegetation communities are crossed by the pipeline alignment. The dominant type is oak-hickory forest, followed by beech-maple forest.

Oak-hickory forest is dominated by a canopy consisting of red oak (*Quercus rubrum*), white oak (*Quercus alba*), chestnut oak (*Quercus montana*), black oak (*Quercus velutina*), and with lesser amounts of shagbark hickory (*Carya ovata*), pignut hickory (*Carya glabra*), mockernut hickory (*Carya tomentosa*), white ash (*Fraxinus americana*), and tulip-poplar (*Liriodendron tulipifera*). Historically, American chestnut (*Castanea dentata*) was a dominant or co-dominant in this community until its virtual elimination due to the chestnut blight caused by the accidental introduction of the pathogenic fungus *Cryphonectria parasitica* during the early 1900s. Common sub-canopy species in oak-hickory forests include Eastern redbud (*Cercis canadensis)*, eastern hop-hornbeam (*Ostrya virginiana)*, flowering dogwood (*Cornus florida)*, and various maples (*Acer* sp.) (VDCR-DNH, 2013). The herbaceous layer within oak-hickory forests varies greatly and is dependent on local site conditions. Common species encountered include cut-leaf toothwort (*Cardamine concatenata*), rue-anemone (*Thalictrum thalictroides*), star chickweed (*Stellaria pubera*), and spring beauty (*Claytonia virginica* var. *virginica*), woodland agrimony (*Agrimonia rostellata*), four-leaf

milkweed (*Asclepias quadrifolia*), curlyheads (*Clematis ochroleuca*), Bosc's panic grass (*Dichanthelium boscii*), naked-flowered tick-trefoil (*Hylodesmum nudiflorum*), bottlebrush grass (*Elymus hystrix*), bedstraws (particularly *Galium circaezans* and *Galium latifolium*), Eastern solomon's-plume (*Maianthemum racemosum* ssp. *racem*osum), rock muhly (*Muhlenbergia sobolifera*), goldenrods (particularly *Solidago caesia* var. *caesia* and *Solidago ulmifolia*), yellow pimpernel (*Taenidia integerrima*), lesser horse-gentian (*Triosteum angustifolium*), and wood violet (*Viola palmata*).

Beech-maple forest is dominated by American beech and sugar maple with other canopy tree species including American basswood (*Tilia americana*), white ash, red maple (*Acer rubrum*), red oak, paper birch (*Betula papyrifera*), yellow birch, and tulip-poplar. Common sub-canopy trees and shrubs include eastern hop-hornbeam, American elm (*Ulmus americana)*, balsam fir (*Abies balsamea)*, striped maple (*Acer pensylvanicum*), mountain maple (*Acer spicatum*), alternate-leaved dogwood (*Cornus alternifolia*), leatherwood (*Dirca palustris*), viburnums (*Viburnum* spp.), and red elderberry (*Sambucus pubens*). Numerous spring ephemerals and perennial herbs are found within beech-maple forests and prevalent species include white baneberry (*Actaea pachypoda*), wild leek (*Allium tricoccum)*, wild sarsasparilla (*Aralia nudicaulis)*, jack-in-the-pulpit (*Arisaema triphyllum*), various sedges (*Carex* spp.), blue cohosh (*Caulophyllum thalictroides*), bunchberry (*Cornus canadensis)*, Canada mayflower (*Maianthemum canadense*), and sweet cicely (*Osmorhiza claytonii).*

Evergreen Forest

According to the 2011 NLCD, evergreen forests are areas dominated by trees generally greater than 15 feet tall, and contain greater than 20 percent of total vegetation cover. More than 75 percent of the tree species maintain their leaves all year, thus ensuring the canopy is never without green foliage.

Evergreen forests along the northern portions of the Project route are dominated by monocultures or mixtures of table mountain pine (*Pinus pungens*), pitch pine (*Pinus rigida*), shortleaf pine (*Pinus echinata*), Virginia pine (*Pinus virginiana*), red pine (*Pinus resinosa)*, and white pine (*Pinus strobus)*, with southern portions of the Project transitioning into scattered spruce-fir evergreen forests occurring at higher altitudes.

Mixed Deciduous-Evergreen Forest

According to the 2011 NLCD, mixed deciduous-evergreen forests are areas dominated by trees generally greater than 15 feet tall and contain greater than 20 percent of total vegetation cover. Neither deciduous nor evergreen species are greater than 75 percent of total tree cover. Mixed deciduous-evergreen forests can contain a mixture of the dominant canopy, sub-canopy, shrub, and herbaceous species described above for deciduous and evergreen forests.

3.4.2.3 Open Land

According to the 2011 NLCD, scrub-shrub land are areas dominated by shrubs less than 15 feet tall with shrub canopy typically greater than 20 percent of total vegetation. This class includes true shrubs, young trees in an early successional stage, or trees stunted from environmental conditions. Common shrub species can include multiflora rose, Allegheny blackberry (*Rubus allegheniensis)*, black raspberry (*Rubus occidentalis*), dogwoods (*Cornus* spp.), autumn olive (*Elaeagnus umbellata),* spicebush (*Lindera benzoin*), black elder (*Sambucus nigra*), mountain laurel (*Kalmia latifolia)*, witch hazel (*Hamamelis virginiana*), azaleas (*Rhododendron* spp.), sumac (*Rhus* spp.), willows (*Salix* spp.), and blueberries (*Vaccinium* spp.).

3.4.2.4 Herbaceous Upland

Herbaceous upland includes natural to semi-natural areas of open grassland. According to the 2011 NLCD, grassland is dominated by grammanoid or herbaceous vegetation, generally greater than 80 percent of total vegetation, and is not subject to intensive management such as tilling but can be utilized for grazing. Common grassland species with potential to occur within the Project area include orchard grass (*Dactylis glomerata)*, red fescue (*Festuca rubra*), common velvet grass (*Holcus lanatus*), Japanese stilt grass, , Kentucky blue grass (*Poa pratensis*), meadow false rye grass (*Schedonorus pratensis*), white clover (*Trifolium repens)*, wingstem (*Verbesina alternifolia*), giant ironweed (*Veronia gigantea)*, and reed canary grass (*Phalaris arundinacea*).

3.4.2.5 Wetlands

The Project identified wetlands crossed by the Project using a combination of field wetland delineations where survey access was available, and desktop data using USFWS National Wetland Inventory mapping where survey access was not available. Additional detail regarding wetlands impacted by the Project is included in Resource Report 2.

3.4.3 Unique, Sensitive, or Protected Vegetation

This section summarizes unique, sensitive, and protected vegetation crossed by the Project. In May 2018, the Project initiated consultation with the federal and state resource agencies to determine if any federally or state listed threatened and endangered plant species or designated communities occur within the Project area. Agencies contacted by the Project include the USFWS, NCWRC, NCNHP, VDGIF, and the VDCR-DNH. Consultation with the agencies is ongoing, and copies of all agency correspondence to-date is located in Appendix1-K of Resource Report 1.

Virginia

Based on initial consultation with the USFWS Virginia Field Office, no federally-listed plant species or special plant communities are expected to be present within the Project area (Agency Consultations [see Appendix 1-K of Resource Report 1]). Consultation with VDCR-DNH indicated that there are no State Natural Area Preserves under DNH's jurisdiction in the project vicinity. Therefore no impacts are anticipated on sensitive vegetation within Project area. Initial consultation with VDCR-DNH identified three plant species that have historical records near the Project: Piedmont Barbara's-button (*Marshallia obovata* var. *obovata*), Downy phlox (*Phlox pilosa*) and American blueheart (*Buchnera americana*). These species are described in more detail in Section 3.5.2.1. The Project continues to consult with USFWS and VDCR-DNH to determine the need for presence-absence surveys and recommended avoidance and minimization measures, if applicable.

North Carolina

The USFWS Raleigh Field Office did not identify any known special plant communities to occur within the Project area in North Carolina. However, initial consultation with the USFWS did indicate the potential presence of two federally-listed plant species in the Project area: small-whorled pogonia (*Isotria medeoloides*) and smooth coneflower (*Echinacea laevigata*). These species are described in greater detail in Section 3.5.1.3.

The Project is currently conducting species-specific surveys using a meander search technique within predetermined areas along the Project route to determine whether the either species or their preferred habitats occur within the Project area.

The survey areas were determined by detailed analysis of forest cover based on aerial imagery, soils, slopes, and slope aspects. Overall, the Project has identified 271.2 acres of survey area for the small whorled pogonia and 88.3 acres of survey area for the smooth coneflower within the survey corridor associated with the pipeline. The Project submitted a detailed survey plan to the USFWS Raleigh Field Office and the NCWRC for the rare plant habitat assessments and surveys in July 2018. Upon completion of any field surveys, results will be submitted to the agencies for review and comment. If either species is found to be present within the survey corridor, the Project will continue to consult with the USFWS to determine recommended avoidance and minimization measures.

Based on initial consultation with NCNHP, there are also records of one state-listed rare plant species, cliff stonecrop (*Sedum glaucophyllum*), near the Project area (Agency Consultations [see Appendix 1-K of Resource Report 1]). The Project continues to consult with NCNHP to determine the need for survey for this species. The NCNHP also identified several vegetation community types, natural areas and managed areas with potential for sensitive and/or protected species in the vicinity of the Project area. The Project evaluated these areas further and determined that the all of the natural and managed areas identified by NCNHP are either outside of the Project area or the portions of the areas within the survey corridor appear to be disturbed (i.e., regularly mowed open areas) (see Table 3.4-2, Tables Section). Therefore no impacts are anticipated to sensitive vegetation within the natural and managed areas.

3.4.4 Non-Native/Invasive Plant Species

An invasive species is typically not native to an ecosystem and causes, or is likely to cause, harm to the economy, environment, or human health (USFWS, 2018b). Invasive species alien to a new area often thrive due to their ability to tolerate a wide variety of habitat conditions, grow aggressively and rapidly, produce large seed quantities, and spread easily throughout the environment with a lack of natural predators or controls (United States Forest Service, 2018). Invasive species excel in regularly disturbed areas where human activity enables the continual spread. Invasive plants can disrupt and degrade the natural vegetative community, reducing the overall habitat quality for native wildlife and vegetation.

The Project utilized the VDCR-DNH Virginia Invasive Plant Species List and the North Carolina Invasive Plant Council List (Virginia Invasive Species Council, 2005 and North Carolina Invasive Plant Council, 2016) to identify potential invasive plant species that may occur within the Project area. Based on the preliminary surveys conducted, invasive species are prevalent throughout the survey corridor. In Virginia, the most commonly observed invasive species include Japanese honeysuckle (*Lonicera japonica*), Chinese Lespedeza (*Lespedeza cuneate*), High Japanese stilt-grass, Chinese privet (*Ligustrum sinense*) and Tree of Heaven (*Ailanthus altissima*). In North Carolina, the most commonly observed invasive species include Japanese honeysuckle, Japanese stilt-grass, Multiflora rose, Chinese privet and Tree of Heaven.

Construction-related disturbances to the existing vegetation and subsequent bare ground increase the potential for infestations of non-native, invasive plant species. These species are usually concentrated in areas of prior or recurring disturbance such as roadsides, existing utility ROWs, residential use areas, and agricultural areas. Despite efforts to prevent or minimize the spread of non-native, invasive vegetation, it is possible the construction, operation, and maintenance activities associated with the Project will increase

the prevalence or introduction of harmful vegetation along the proposed route. To reduce this risk, the Project will implement measures in the FERC Plan and Procedures including employing one environmental inspector per construction spread who is adequately trained in field identification of highly noxious invasive plant species to ensure equipment is free of debris before being transported to a new construction spread through use of designated equipment cleaning stations. The Project will replant areas disturbed during construction with native seed mixes. The prevention and control of non-native invasive species is further discussed in the Exotic and Invasive Species Control Plan provided in Appendix 3-C. *[Note: The Project continues to prepare its Exotic and Invasive Species Control Plan for the MVP Southgate Project. Additional information will be provided in the final Resource Reports included with the Certificate application expected to be filed in November 2018.]*

3.4.5 Construction Impacts and Mitigation

This section summarizes Project construction and operation impacts on vegetation. The clearing for the pipeline will consist of a 100-foot wide area within the construction ROW except at wetland and waterbody crossings where clearing will be reduced to 75 feet in accordance with the FERC Procedures. Once the pipeline is installed, a 50-foot wide permanent ROW will remain. Table 3.4-1 (see Tables Section) provides the approximate acreages of forested land that would be affected during construction and operation of the Project.

Construction of the pipeline and aboveground facilities will include short-term, long-term, and permanent impacts on the existing vegetation cover types previously described. To the extent possible, the proposed pipeline has been aligned parallel to existing utility ROWs and other linear features, and the Project will utilize existing access roads including private roads, drives, lanes, farm roads, or roads from previous construction to minimize clearing. Construction of the pipeline adjacent to existing rights-of-way will minimize impacts on vegetation by reducing trampling, compaction, land use change, tree clearing, and stump removal activities.

The proposed pipeline construction ROW and temporary workspaces will be cleared of vegetation prior to construction to provide safe working conditions. The construction workspace, pipeline centerline, and any ATWS will be identified and staked by the civil survey crew prior to the start of clearing operations. Timber will be cut into usable lengths and stacked adjacent to the ROW in accordance with landowner preferences. Non-merchantable brush and slash will be burned, stacked, or chipped. All stumps will be disposed of to the satisfaction of the property owner and/or the environmental inspector. When feasible, vegetation will be cut to ground level only, leaving the root systems intact. Erosion control measures from the FERC Plan and Procedures and applicable regulatory approvals will be implemented along the construction ROW, and erosion controls will be properly maintained throughout construction and restoration. Temporary erosion controls will remain in place until permanent erosion controls are installed and the ROW is determined to be successfully revegetated in accordance with the FERC Plan and applicable regulatory approvals.

During operation, vegetation maintenance of the ROW is required to allow continued access for routine pipeline patrols, maintaining access in the event of emergency repairs, and visibility of aerial patrols. Following construction, all areas disturbed by construction will be restored, and a 50-foot wide permanent ROW will be maintained by the Project for the pipeline. The areas disturbed by construction will be restored to their original grades, condition and uses to the greatest extent practicable. Aboveground facilities will be fenced and converted to industrial use. Restoration will be considered successful if the

ROW surface condition is similar to adjacent undisturbed lands, construction debris is removed, revegetation is successful, and proper drainage has been restored.

In upland areas, trees or deep-rooted shrubs will be removed from the construction ROW and will not be permitted to grow within the 50-foot-wide permanent ROW. Depending on the time of year, a temporary seed mix may be broadcast or drilled until a more permanent cover can be established. The maintained permanent ROW will be periodically mowed and will result in permanent conversion of some areas of existing upland forested vegetation to herbaceous or scrub vegetation. Within wetlands or adjacent waterbodies, the Project will maintain vegetation in an herbaceous state in a 10-foot corridor centered over the pipeline by mechanical means. Trees will not be allowed to grow within 15 feet of the centerline within wetlands. Following seeding and ground stabilization, the Project will allow natural recruitment of trees and vegetation in riparian areas that occur outside of the 50-foot permanent ROW. Maintenance of vegetation is not expected to be required in agricultural or grazing areas.

The timeframe for revegetation of areas disturbed by Project construction will depend on factors such as site topography, aspect, soil texture, and micro climate. All areas not in active farming (i.e. cultivated crops) will be seeded with restoration seed mixes of native grasses and forbs, and are expected to be successfully vegetated with grasses within one or two growing seasons and other forbs and legumes within two to six growing seasons. Seed mixes will be developed to maximize the success of revegetation, including a localized analysis of mixes best suited for use on specific segments of the pipeline.

In accordance with the FERC Plan, the Project will monitor all areas disturbed by construction of the Project to determine the post-construction revegetative success for a minimum of two growing seasons following construction, or until revegetation is successful.

3.5 ENDANGERED, THREATENED, AND SPECIAL CONCERN SPECIES

The ESA of 1973 (16 United States Code A-1535-1543, P.L. 93-205) provides for the listing, conservation, and recovery of endangered and threatened species of plants and wildlife. Under the ESA, plants and animals provide aesthetic, ecological, educational, historic, and scientific value to the United States. The USFWS is mandated to monitor and protect all federally-listed freshwater and terrestrial species, whereas the NMFS is responsible for marine species. A federally-listed endangered species is any species in danger of extinction throughout all or a significant portion of its range. A federally-listed threatened species is any species likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

The ESA also provides protection for "critical habitat" that, as defined by the USFWS, are (1) specific areas within the geographical area occupied by the species, at the time of listing, on which are found those physical or biological features essential to the conservation of the species and which may require special management considerations or protections; and (2) specific areas outside the geographical area occupied by the species at the time it is listed and are determined to be areas essential for the conservation of the species.

Under provisions of the ESA, all states were granted the authority to enact their own endangered species protection policies. State-specific regulations are as follows:

The Virginia Endangered Species Act (29.1-563 to 29.1-570) states that the VDGIF is the regulatory authority over state-listed threatened or endangered fish and wildlife in Virginia. State-listed species are

provided protection per VDGIF Regulation 4 VAC 15-20-130. The law authorizes the Board of the VDGIF to adopt the federal list of endangered and threatened species, to declare by regulation that species listed as endangered or threatened by the federal government are also listed as such in Virginia, and to prohibit by regulation the taking, transportation, processing, sale, or offer for sale of those species. Implementing regulations pursuant to this authority (4 VAC 15-20-130 through 140) defines "take" and other terms similarly to the federal ESA.

The North Carolina Endangered Species Act (G.S. 113-331 to 113-337 Act 25) states that the NCWRC is the regulatory authority over state-listed endangered, threatened, or species of special of concern. The regulation allows the NCWRC to adopt the federal list of endangered and threatened species, and develop a list of state "protected species." State protected species are separated into three separate categories; North Carolina Endangered, North Carolina Threatened, and North Carolina Special Concern. The definitions are as follows:

- North Carolina Endangered: "*Any native or once-native species of wild animal whose continued existence as a viable component of the State's fauna is determined by the Wildlife Resources Commission to be in jeopardy or any wild animal determined to be an "endangered species" pursuant to the Endangered Species Act."*
- North Carolina Threatened: *"Any native or once-native species of wild animal that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range or one that is designated as a threatened species pursuant to the Endangered Species Act."*
- North Carolina Special Concern: *"Any species of wild animal native or once native to North Carolina that is determined by the Wildlife Resources Commission to require monitoring but that may be taken under regulations adopted under the provisions of Article 25."*

3.5.1 Federally Protected Species

Federally-Endangered and Federally-Threatened Species

Based on initial consultation with the USFWS and review of spatial data provided by state natural heritage programs, ten federally-endangered or federally-threatened species were identified to potentially be within the Project counties. However, five of these species are currently not known to be located in areas crossed by the Project area, including the gray bat (*Myotis grisescens*), Indiana bat (*Myotis sodalis*), Virginia big-eared bat (*Corynorhinus townsendii virginianus*) yellow lance (*Elliptio lanceolata*), and Cape Fear shiner (*Notropis mekistocholas*). The five federally-listed species that could potentially occur within areas crossed by the Project include two aquatic species, one mammal species, and two species of plants:

- James spinymussel *(Parvaspina collina*, formally *Pleurobema collina)*
- Roanoke logperch *(Percina rex)*
- Northern long-eared bat (*Myotis septentrionalis*)
- Small whorled pogonia
- Smooth coneflower

No critical habitat has been designated for the James spinymussel, Roanoke logperch, northern long-eared bat, small whorled pogonia or the smooth coneflower. The Cape Fear shiner has designated critical habitat; however, none of the designated critical habitat is located within the Project area (Agency Consultations [see Appendix 1-K of Resource Report]).

Sections 3.5.1.1, 3.5.1.2 and 3.5.1.3 describe the five federally-endangered or threatened species with potential to be found within areas crossed by the Project.

Federal Species of Concern

In addition to the federally-listed species, six federal species of concern have been identified by the USFWS which may occur within areas crossed by the Project. Federal species of concern are not afforded federal protection, however the list includes species that appear to be in decline through various agencies (NCNHP, 2016). The six species of concern include three bat species and three mussel species. The mussels include the green floater (*Lasmigona subviridis*), yellow lampmussel (*Lampsilis cariosa*) and Atlantic pigtoe (*Fusconaia masoni*). The bats include the eastern small-footed bat (*Myotis leibii*), Rafinesque's big-eared bat (*Corynorhinus rafinesquii rafinesqui*), and eastern big-eared bat (*Corynorhinus rafinesquii macrotis*). These species are not anticipated to be found in areas crossed by the Project. As a voluntary conservation measure, the Project conducted presence/absence surveys for listed bat species using a targeted approach as described in Section 3.5.1.2. Additionally, the Project continues consultation with the USFWS to determine the appropriate level of effort recommended for field surveys for mussel species. Upon completion of any recommended field surveys, all results will be submitted to applicable state and federal agencies for review and comment and filed with the FERC.

3.5.1.1 Aquatic Species

The NMFS indicated that no threatened or endangered species under NMFS jurisdiction are known to exist in the Project area. No waterbodies crossed by the Project contain or have the potential to support species managed by the NMFS. As such, protected marine species are not discussed further (NMFS, 2017).

Two federally-listed aquatic species were identified by USFWS that could occur within waterbodies crossed by the Project, including the James spinymussel and the Roanoke logperch.

James Spinymussel

The James spinymussel is a freshwater mussel species characterized by a three-inch long, dark brown shell with prominent growth rings and occasional short spines on each valve. Adults have an orange foot and mantle. The mantle has a darkly pigmented narrow band around the edges of the branchial and anal openings. Shells of juveniles are a shiny yellow and can have one to three short, but prominent, spines on each valve. James spinymussels prefer unpolluted waters with substrate composed of cobble and sand in reaches with slow to moderate currents (USFWS, 1990). The James spinymussel is known to, or believed to, occur in the James River drainage and the Dan/Mayo River systems within the Roanoke River drainage in Virginia, North Carolina, and West Virginia (USFWS, 2018c). The James spinymussel was listed as federally-endangered in 1988.

James spinymussel was not identified by USFWS to be present within waterbodies crossed by the Project in Virginia (see Appendix 1-K of Resource Report 1). In North Carolina, consultation with the USFWS Raleigh Field office and NCWRC indicated the Project crosses one waterbody (Dan River) potentially

inhabited by the James spinymussel. A freshwater mussel study plan is in preparation and will be submitted to the appropriate agencies prior to initiating surveys; the study plan incorporates guidance provided by NCWRC and the Freshwater Mussel Guidelines for Virginia (2015). Upon completion of recommended field surveys, results will be submitted to applicable state and federal agencies for review and comment. If James spinymussels are found in the Project area and impacts are possible, the Project will relocate live mussels in coordination with USFWS guidelines.

Roanoke Logperch

The Roanoke logperch is a large darter (approximately 4.5 inches in length) with a long, conical snout, inferior mouth, and a moderate to robust body form (Rosenberger 2007). The dorsal is dark green and sides are greenish to yellowish, both with dark markings; the venter is white to yellowish (USFWS, 2010). The Roanoke logperch is typically found in deep, high velocity riffle-run habitats of medium to large warm, clear streams and small rivers. Spawning occurs in April or May when eggs are buried with no subsequent parental care (Rosenberger, 2002). The Roanoke logperch is only found in portions of Virginia and North Carolina. Until 2007, the species was known from five populations in widely separated segments of the upper Roanoke, Pigg, Smith, Nottoway, and Meherrin Rivers when it was discovered in two new watersheds, Goose Creek and Big Otter River (Lahey and Angermeier, 2007). The Roanoke logperch was listed as federally-endangered in 1989.

Through coordination with the USFWS and NCWRC, Roanoke logperch were identified as present within the Dan River, and may inhabit two additional North Carolina streams (Wolf Island Creek and Cascade Creek). Agencies did not identify a need to conduct fish surveys; however, any state listed, federal listed, or species of greatest conservation need as listed in the 2015 NC Wildlife Action Plan encountered during freshwater mussel and crayfish surveys will be noted and provided to NCWRC. The Project continues consultation with the appropriate agencies to determine recommended surveys in Virginia streams. Upon completion of recommended field surveys, results will be submitted to applicable state and federal agencies for review and comment and filed with FERC. If Roanoke logperch are found during Project surveys and impacts are possible, fishes will be removed from temporarily dewatered stream crossings and relocated to suitable habitat away from the construction area as requested by NCWRC. The Project commits to working with the agencies to determine applicable avoidance, minimization, or mitigation strategies (i.e. relocation surveys, time of year restrictions) to minimize impacts on this species.

3.5.1.2 Mammal Species

Based on initial consultation with the USFWS, NCWRC, VDGIF, and review of spatial data provided by state natural heritage programs, one federally-listed mammal species, the northern long-eared bat, could potentially occur within areas crossed by the Project (Table 3.5-1, Tables Section).

Northern Long-eared Bat (*Myotis septentrionalis*)

The northern long-eared bat weighs approximately 0.17 to 0.28 ounces at maturity and its right forearm measures 1.3 to 1.5 inches. The northern long-eared bat is best recognized by the combination of long ears (0.7 inches) and a long and thin tragus (0.4 inches) (Whitaker and Mumford, 2009). The pelage is typically a light to dark brown dorsally and light brown ventrally (Caceres and Barclay, 2000; Whitaker and Mumford, 2009). Ears and wing membranes are usually a dark brown. The bat inhabits trees during summer and hibernates in caves (and mines) during winter. The geographic range includes Alabama, Arkansas,

Delaware, District of Columbia, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, South Carolina, South Dakota, Tennessee, Virginia, West Virginia, and Wisconsin (USFWS, 2018c).

Based on hibernacula studies, the northern long-eared bat has suffered estimated losses of up to 98 percent across the Northeastern United States since 2005 (Turner et al., 2011), despite the fact that only a tiny fraction (less than one percent) of bats of this species is known from winter hibernacula. In Virginia, its decline was based on seven and nine bats at two caves pre and post white-nose syndrome (29 percent increase). In 2015, the northern long-eared bat was listed as federally threatened, and in 2016 the final section 4(d) was published and took effect. The 4(d) ruling contains the following provisions:

For areas of the country impacted by white-nose syndrome, the measures provided in the 4(d) rule (as applied to this Project) exempt take as long as clearing activities include the following measures:

- activity must occur more than 0.25 mile (0.4 km) from a known, occupied hibernacula; and
- activity avoids cutting or destroying known, occupied maternity roosts and trees within a 150-foot radius of the maternity roost tree during the pup season (June 1 – July 31).

The Project is located within the range of the federally-threatened northern long-eared bat. Occurrence records exist in the Virginia portion (Pittsylvania County) of the Project. The species is not known to occur in the North Carolina portions of the Project (USFWS, 2018d). There are no known summer maternity roosts or winter hibernacula in the Project vicinity, therefore, potential impacts to the species would be exempted under the species' Final 4(d) rule (USFWS, 2016). Based on this data, FERC's Requirements under Section 7(a)(2) of the Endangered Species Act for the Project are met. However, the USFWS requested surveys because bat occurrence data within the Project area is significantly limited; therefore, the Project conducted targeted field surveys for bats as a voluntary conservation measure for the Project.

A desktop habitat assessment was completed for the Project using the Multi-Resolution Land Characteristics Consortium's 2011 National Land Cover Database (Homer, 2015). Survey blocks were identified for areas potentially conducive to high bat activity. Following the USFWS *Range-wide Indiana Bat Summer Survey Guidelines* (2018), presence/absence surveys were completed in 15 survey blocks in North Carolina (63 survey sites within the survey blocks) and five survey blocks in Virginia (30 survey sites within the survey blocks). Suitable habitat was targeted for these survey blocks. The Southgate Project Bat Survey Study Plan detailing survey type, effort, and locations was submitted to the USFWS, NCWRC, and VDGIF in July 2018. The Bat Survey Study Plan was approved on July 24, 2018 and is included in Appendix 3-A of this Resource Report. The proposed bat surveys were completed in August 2018. Results of bat surveys will be provided to federal and state agencies for review and comment and filed with the FERC. The Project will continue consultation regarding potential impact avoidance, minimization and mitigation measures to be incorporated to the Project.

Many bat species, including the northern long-eared bat, hibernate in underground voids, including natural caves and constructed mines. If these areas are used by hibernating bats, they become known as hibernacula. Hibernacula are important to the natural history and life cycle of the bats that inhabit those (USFWS, 2015). As such, it is important to identify any hibernacula by locating potential entrances (portals) to caves or mines in areas crossed by the Project. Once this is done, the portals of any identified

hibernacula would be surveyed for target species. Bat portal searches were initiated in June 2018 concurrently with the biological field surveys for the Project and will continue until completion. Approximately 78 percent of the Project has been surveyed and no potentially suitable portal habitats have been identified to date. If any are identified, the Project will conduct portal search surveys in coordination with the appropriate agencies.

Upon completion of any field surveys, summary reports will be submitted to USFWS, VDGIF and NCWRC for review and comment and filed with the FERC. The Project is committed to working with the agencies to determine applicable avoidance, minimization or mitigation strategies to minimize impacts to this species.

3.5.1.3 Plant species

Based on initial coordination with agencies, three state-rare plant species in Virginia and one state rare species in North Carolina were identified as potentially occuring in areas crossed by the Project. These species are detailed in Section 3.5.2.1. Based on consultation with USFWS, two federally-listed plant species, small whorled pogonia and smooth coneflower could potentially occur in areas crossed by the Project in North Carolina (Table 3.5-1, Tables Section).

Small Whorled Pogonia

The small whorled pogonia, a member of the orchid family, has a single gray-green stem (10 to 14 inches tall) and a whorl of five to six leaves at the top of the stem. The leaves are gray-green, oblong, and can reach 1 to 3.5 inches. A single or pair of green-yellow flowers appears in May or June (USFWS, 2008b). The small whorled pogonia is found in mature, hardwood stands of beech (*Fagus* spp.), birch (*Betula* spp.), maple (*Acer* spp.), oak (*Quercus* spp.), and hickory (*Carya* spp.) with an open understory (USFWS, 1992 and USFWS, 2008b). The small whorled pogonia occupies acidic soils under a thick layer of dead leaves, often, but not exclusively, on slopes adjacent to small streams (USFWS 1992, USFWS 2008b). Although widely distributed across 17 eastern states, the small whorled pogonia is rare with populations typically containing less than 20 plants. It was listed as federally-endangered in 1982, but was reclassified to threatened in 1994 (USFWS, 2018c). No published critical habitats are designated for the small whorled pogonia.

Smooth Coneflower

The smooth coneflower is an herbaceous perennial in the aster family (*Asteraceae*) growing up to three to four feet tall from a vertical root stock. Basal leaves may reach eight inches in length and three inches wide and are smooth to slightly rough in texture (USFWS, 1995). Stems are smooth and contain fewer leaves than the base. Flower heads are usually solitary and contain 13 to 21 rays that are light pink to purplish, usually drooping, and two to 3.2 inches long (USFWS, 1995). Flowering occurs from late May through mid-July, with fruits developing from late June to September. Fruiting structures often persist through autumn. Smooth coneflower occupies open, sunny areas where competition from other plants is minimal, and requires neutral to alkaline soils rich in calcium and magnesium in well drained areas. Scattered populations are found in Georgia, North Carolina, South Carolina, and Virginia (USFWS, 1995). It was listed as federally-endangered in 1992, however no critical habitat has been designated for this species (USFWS, 2018c).

The Project is currently conducting rare plant surveys using a meander search technique within predetermined areas along the Project to determine whether either species or their preferred habitats occur. The Project submitted a detailed survey plan for federally-listed plant habitat assessments and surveys on July 19, 2018 to the USFWS Raleigh Field Office and the NCWRC (see Appendix 3-A). Upon completion of field surveys, results will be submitted to USFWS and NCWRC for review and comment and filed with FERC. The Project is committed to working with the agencies to determine applicable avoidance, minimization or mitigation strategies to minimize impacts to these species.

3.5.2 State Protected Species

Based on initial coordination with the VDGIF, NCWRC and review of spatial data provided by state natural heritage programs, it was determined that several state protected species potentially occur in areas crossed by the Project. The Project is consulting with applicable state agencies regarding survey recommendations. Results of all recommended surveys will be provided to state agencies for review and comment and filed with the FERC. The Project will continue consultation regarding potential impact avoidance, minimization and mitigation measures to be incorporated to the Project. The state protected species identified for the Project are listed in Table 3.5-1 (see Tables Section) and discussed in more detail below.

3.5.2.1 Virginia

Virginia State-Threatened and State-Endangered Species

Based on initial consultation with the VDGIF and VDCR-DNHG, 14 state-endangered or state-threatened species were identified to potentially be in Project Counties. However, 10 of these species are currently not known to be located in areas crossed by the Project, including the eastern big-eared bat, gray bat, Indiana bat, little brown bat (*Myotis lucifugus*), Rafinesque's big-eared bat, Virginia big-eared bat, James spinymussel, Atlantic pigtoe, small whorled pogonia and smooth coneflower. The four Virginia listed species that could potentially occur in areas crossed by Project include two aquatic species and two mammal species:

- Roanoke logperch
- Green Floater
- Northern long-eared bat (*Myotis septentrionalis*)
- Tricolored bat (*Perimyotis subflavus*)

Virginia Rare Species

Virginia considers species with state rankings of Critically Imperiled and Imperiled (S1 and S2) as state rare species. Based on initial consultation with VDCR-DNH, three state rare plant species were identified as potentially being within areas crossed by the Project. These species include the Piedmont Barbara's-button, Downy phlox and American blueheart. Species considered rare by Virginia do not have a legal status and are not afforded state protections. The VDCR-DNH recommended conducting rare plant surveys along the proposed pipeline route, therefore these three species are discussed in more detail in the following sections.

Virginia Species of Greatest Conservation Need

Virginia has a Wildlife Action Plan ("WAP") (VDGIF, 2015) that identifies Species of Greatest Conservation Need and further categorizes species of conservation needs by a tier ranking system ranging from Tier I (greatest concern) to Tier IV (moderate concern). Species with a ranking are not technically state-listed, however they are species that may require habitat considerations. The species with a Tier Ranking that may be found within areas crossed by the Project include four bat species and one salamander species: eastern red bat (*Lasiurus borealis*; Tier IV), eastern small-footed bat (Tier I) (hoary bat (*Lasiurus cinereus*; Tier IV), silver-haired bat (*Lasionycteris noctivagans*; Tier IV), southeastern bat (*Myotis austroriparius*; Tier IV), and the mole salamander (*Ambystoma talpoideum*; Tier IIa). Species listed in the WAP are not considered as having a legal status and therefore are not afforded state protections. Consultation with Virginia agencies is ongoing, and avoidance measures recommended for WAP listed species will be considered.

The following sections describe the four Virginia endangered or threatened species and the three rare plant species with potential to be found within areas crossed by the Project area.

Aquatic Species

Roanoke Logperch

In Virginia, the Roanoke logperch is listed as state-endangered. See Section 3.5.1.1 for a detailed description of the logperch.

Green Floater

Green floater is a small mussel species with adult individuals generally being less than two inches in length. The shells are extremely thin and subovate or trapezoidal in shape. The periostracum varies from dull yellow to green with many dark green rays visible, particularly in young individuals. The nacre is white and has a bluish iridescent tinge towards the posterior. Green floater is intolerant of strong currents and is often in small to medium sized streams in quiet pools and eddies with gravel and sand substrate and depths of one to four feet. The species is associated with good to excellent water quality (Pennslyvania Natural Heritage Program, 2007a and NRWRC, 2018). Green floater is listed as state-threatened in Virginia.

Mammal Species

Northern Long-eared Bat (*Myotis septentrionalis*)

In Virginia, the northern long-eared bat is listed as state-threatened. See Section 3.5.1.2 for a detailed description of the northern long-eared bat and survey efforts.

Tricolored Bat

The tricolored bat is small with a wingspan of 8-10 inches and weighs between 0.2 and 0.3 ounces. Its coat is yellowish-brown varying in three areas, from dark at the base, yellowish-brown in the middle, and dark at the tips. It has a pinkish face and ears and a black wing membrane. It is easily identified by its pink colored skin on its radius bone. During the summer months, this bat utilizes forested landscapes, often around open woods or standing water where they hunt for flying insects. Standing dead/hollow trees are an important maternity roosting habitat and they utilize caves, mines, and rock crevices as nightly roosts.

Hibernation sites include caves, mines, or cave-like tunnels (North Carolina Bat Working Group, 2013). The tricolored bat is listed as state-endangered in Virginia.

Plant Species

American Bluehearts

American bluehearts are perennial herbaceous plants with spikes of deep purple flowers blooming from July to early September. The plant occurs in seasonally moist to dry soils of barrens, clearings, old fields, meadows, and roadsides; it is found on calcareous or mafic substrates in the mountains and Piedmont and on basic sandy or clayey soils in the Coastal Plain (Weakley et al., 2015). As of 2014, 17 occurrences of this state rare plant were documented by the VDCR-DNH, eight historic and nine extant. Threats to populations include loss of habitat due to fire suppression and succession as well as competition from invasive species (Weakley et al., 2015). American bluehearts is considered rare in Virginia.

Downy phlox

The downy phlox inhabits dry to mesic woodlands and forests and has also been found in such disturbed areas as road banks and powerline ROWs. This perennial plant blooms in May and June (Weakley, 2015). Downy phlox is currently known from four locations in Virginia and historically known from multiple locations in the state. Downy phlox is considered rare in Virginia.

Piedmont Barbara's-button

Piedmont Barbara's-buttons, a perennial herb, typically inhabits clay flats, open grassy areas, forest edges, and wooded areas with open canopies (Radford et. al., 1968 and Weakley, 2015.). It has also been documented in such disturbed areas as powerline corridors (TNC, 1996). Piedmont Barbara's-buttons bloom from late April through early June and ranges from south central Virginia through southwest Georgia (Weakley, 2015.). As of 2014, nine occurrences of this state rare plant were documented by the VDCR-DNH, five extant and four historic. The Piedmont Barbara's-buttons is considered rare in Virginia.

3.5.2.2 North Carolina

North Carolina State-Endangered and State-Threatened Species

Based on initial consultation with the NCNHP and NCWRC, 14 state-endangered or state-threatened species were identified to potentially be in the region, including county records. However, seven of these species are currently not known to be located within areas crossed by Project, based on habitat and occurence records, including the eastern big-eared bat, gray bat, Indiana bat, Rafinesque's big-eared bat, Virginia big-eared bat, Atlantic pigtoe, yellow lance, and Cape Fear shiner. The seven North Carolina listed species that could potentially occur within areas crossed by the Project area include five aquatic species and two species of plants:

- Roanoke logperch
- Eastern Lampmussel (*Lampsilis radiata*)
- Green Floater
- James Spinymussel

- Yellow Lampmussel
- Small whorled pogonia
- Smooth coneflower

Species of special concern require monitoring by the NCWRC, but may be legally taken. The following species are listed as special concern in North Carolina; Greensboro burrowing crayfish crayfish (*Cambarus catagius*), four-toed salamander (*Hemidactylium scutatum*), mole salamander, riverweed darter (*Etheostoma podostemone*), eastern big-eared bat, eastern small-footed bat, Florida yellow bat (*Lasiurus intermedius floridanus*), Rafinesque's big-eared bat, and the southeastern bat. The following species are listed by NCNHP as significantly rare; Carolina ladle crayfish (*Cambarus davidi*), northern long-eared bat, eastern creekshell (*Villosa delumbis*), and cliff stonecrop. Of the North Carolina species of concern, initial consultations identified recommendations for surveys of four aquatic species and one mammal species; the Greensboro burrowing crayfish, Carolina ladle crayfish, four-toed salamander, mole salamander, and northern long-eared bat. Upon completion of field surveys, results will be submitted to the agencies for review and comment and filed with the FERC. Avoidance measures recommended by NCWRC for species of concern will be considered.

As discussed in section 3.5.1.2, the Project conducted bat mist net and acoustic surveys as voluntary conservation measures. NCWRC concurred with presence/probable absence survey methodology presented in the bat study plan dated July 23, 2018 and recommended changes to several survey sites. These recommendations were not possible to accommodate because of limited survey access or because landowners denied requests to access particular locations. Bat surveys were completed in August 2018.

The follow sections also describe the seven North Carolina state-listed endangered and threatened species identified in the areas crossed by the Project.

Aquatic Species

Roanoke Logperch

In North Carolina, the Roanoke logperch is listed as state-endangered, as well as federally-endangered. See Section 3.5.1.1 for a detailed description.

Through coordination with NCWRC, the Project identified occurrence records of Roanoke logperch and other rare aquatic species from the North Carolina portion of Cascade Creek and Wolf Island Creek. To avoid impacts to Roanoke logperch and high quality habitats found in Cascade Creek and Wolf Island Creek, NCWRC recommended the use of HDD or conventional boring methods. The Project is evaluating the use of conventional boring at these locations. The Project continues consultation with USFWS and NCWRC and commits to working with the agencies to determine applicable avoidance, minimization, or mitigation strategies to minimize impacts on this species.

Eastern Lampmussel

Eastern lampmussels measure up to four inches in length and they are elliptically shaped with a rounded posterior ridge. The periostracum is brown with dark greenish to black rays over most of the rough surface. The nacre is pinkish or salmon with iridescent blue showing towards the posterior of the shell. Their habitat

varies, but they generally occupy substrates comprising medium to coarse sands (NCWRC, 2018). Eastern lampmussel is listed as state-threatened in North Carolina.

Through coordination with NCWRC, the Project determined that records for eastern lampmussel are known from areas upstream of the proposed crossing of Deep Creek. As recommended by NCWRC, this crossing is being evaluated for HDD or conventional bore. The Project is continuing consultation with NCWRC and commits to working with the agencies to determine applicable avoidance, minimization, or mitigation strategies to minimize impacts on this species.

Green Floater

Green floater is listed as endangered in North Carolina, a detailed species description can be found in Section 3.5.1.1.

James Spinymussel

The James spinymussel is listed as endangered in North Carolina, a detailed species description can be found in Section 3.5.1.1.

Yellow Lampmussel

Yellow lampmussel can measure up to five inches in length. The periostracum is smooth, shiny, and yellow with occasional brownish freckling. Rays are distinctly yellow, but occasionally faintly green and are usually on the posterior slope, rarely anterior. The interior of the shell, or nacre, is generally white or bluish-white. Males are elongated and elliptical whereas females are obovate or subovate. Females can be distinguished from males by their development of a large mantle. The mantle is anterior to a large darkly pigmented "eyespot," with a strongly developed flap of tissue on each mantle lobe. Mussels occur in a variety of habitats with preference being in shifting sands downstream of boulders in relatively fast flowing, medium sized rivers and creeks (Pennslyvania Natural Heritage Program, 2007b and NCWRC, 2018). The yellow lampmussel is listed as state-endangered in North Carolina.

On August 10, 2018, NCWRC requested freshwater mussel surveys of nine streams in the Dan River basin and eight streams in the Haw River basin; for Greensboro burrowing crayfish in intermittent and perennial streams of the Haw River basin; and for the Carolina ladle crayfish in all first to third order streams in the Dan and Haw River basins. Survey guidance was provided for these taxa. NCWRC did not request targeted surveys for any fish species. This information will be incorporated into aquatic survey plans, and plans will be filed with appropriate state and federal agencies for comment prior to the commencement of surveys.

Plant Species

Small whorled pogonia

The small whorled pogonia is listed as threatened in North Carolina, as well as federally-threatened. See Section 3.5.1.3 for a detailed description.

Smooth Coneflower

The smooth coneflower is listed as endangered in North Carolina, as well as federally-endangered. See Section 3.5.1.3 for a detailed description.

The Project initiated rare plant surveys in North Carolina using a meander search technique within predetermined areas along the Project to determine whether either species or their preferred habitats occur within areas crossed by Project. Upon completion of field surveys, results will be submitted to the agencies for review and comment and filed with the FERC. The Project is committed to avoiding impacts to rare plant species and will continue to consult with the USFWS and NCWRC to determine additional avoidance and minimization measures.

3.5.3 Impacts and Mitigation

The Project is actively engaged with state and federal natural resource agencies to determine the likelihood that threatened and endangered species are present in areas crossed by the Project and recommendations for subsequent field surveys. Detailed reports containing the methods, results, and conclusions of field surveys for each species will be submitted to the agencies for review and filed with the FERC. The Project will continue coordination with the agencies to determine measures to avoid, minimize, or mitigate anticipated impacts to federal and state threatened and endangered species in the Project area.

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MVP Southgate Project

Docket No. PF18-4-000

Draft Resource Report 3

TABLES SECTION

Table 3.2-1

Representative List of Fish Species with the Potential to Occur Along the MVP Southgate Project Route

Common Name	Scientific Name
Banded Sculpin	*Cottus carolinae*
Bay Anchovy	*Anchoa mitchilli*
Black Bullhead	*Ameiurus melas*
Black Crappie	*Pomoxis nigromaculatus*
Black Jumprock	*Moxostoma cervinum*
Blacknose Dace	*Rhinichthys atratulus*
Blue Catfish	*Ictalurus furcatus*
Bluegill	*Lepomis macrochirus*
Bluehead Chub	*Nocomis leptocephalus*
Bluespotted Sunfish	*Enneacanthus gloriosus*
Bluntnose Minnow	*Pimephales notatus*
Bowfin	*Amia calva*
Brook Trout	*Salvelinus fontinalis*
Brown Bullhead	*Ameiurus nebulosus*
Bull Chub	*Nocomis raneyi*
Central Stoneroller	*Campostoma anomalum*
Chain Pickerel	*Esox niger*
Chainback Darter	*Percina nevisense*
Channel Catfish	*Ictalurus punctatus*
Comely Shiner	*Notropis amoenus*
Common Carp	*Cyprinus carpio*
Common Shiner	*Luxilus cornutus*
Creek Chub	*Semotilus atromaculatus*
Creek Chubsucker	*Erimyzon oblongus*
Crescent Shiner	*Luxilus cerasinus*
Cutlips Minnow	*Exoglossum maxillingua*
Eastern Mosquitofish	*Gambusia holbrooki*
Eastern Silvery Minnow	*Hybognathus regius*
Fantail Darter	*Etheostoma flabellare*
Fathead Minnow	*Pimephales promelas*
Flat Bullhead	*Ameiurus platycephalus*
Flathead Catfish	*Pylodictis olivaris*
Gizzard Shad	*Dorosoma cepedianum*
Glassy Darter	*Etheostoma vitreum*
Golden Redhorse	*Moxostoma erythrurum*
Golden Shiner	*Notemigonus crysoleucas*
Green Sunfish	*Lepomis cyanellus*
Johnny Darter	*Etheostoma nigrum*

Table 3.2-1

Representative List of Fish Species with the Potential to Occur Along the MVP Southgate Project Route

Largemouth Bass	*Micropterus salmoides*
Margined Madtom	*Noturus insignis*
Mimic Shiner	*Notropis volucellus*
Mottled Sculpin	*Cottus bairdii*
Mountain Redbelly Dace	*Chrosomus oreas*
Muskellunge	*Esox masquinongy*
Northern Hog Sucker	*Hypentelium nigricans*
Pumpkinseed	*Lepomis gibbosus*
Quillback	*Carpiodes cyprinus*
Rainbow Trout	*Oncorhynchus mykiss*
Redbreast Sunfish	*Lepomis auritus*
Redear Sunfish	*Lepomis microlophus*
Redfin Pickerel	*Esox americanus americanus*
River Chub	*Nocomis micropogon*
Roanoke Darter	*Percina roanoka*
Rock Bass	*Ambloplites rupestris*
Rosefin Shiner	*Lythrurus ardens*
Rosyface shiner	*Notropis rubellus*
Rosyside Dace	*Clinostomus funduloides*
Satinfin Shiner	*Cyprinella analostana*
Shield Darter	*Percina peltata*
Shorthead Redhorse	*Moxostoma macrolepidotum*
Smallmouth Bass	*Micropterus dolomieu*
Spottail Shiner	*Notropis hudsonius*
Spotted Bass	*Micropterus punctulatus*
Spotted-Margin Madtom	*Noturus insignis ssp 1*
Striped Bass	*Morone saxatilis*
Swallowtail Shiner	*Notropis procne*
Tessellated Darter	*Etheostoma olmstedi*
Torrent Sucker	*Thoburnia rhothoeca*
V-Lip Redhorse	*Moxostoma pappillosum*
Walleye	*Sander vitreus vitreus*
Warmouth	*Lepomis gulosus*
White Bass	*Morone chrysops*
White Catfish	*Ameiurus catus*
White Crappie	*Pomoxis annularis*
White Perch	*Morone americana*
White Shiner	*Luxilus albeolus*
White Sucker	*Catostomus commersonii*

Table 3.2-1 **Representative List of Fish Species with the Potential to Occur Along the MVP Southgate Project Route**	
Whitetail Shiner	*Cyprinella galactura*
Yellow Bullhead	*Ameiurus natalis*
Yellow Perch	*Perca flavescens*
Sources: NCWRC, 2018 and VDGIF, 2018a	

Table 3.2-2

Fisheries of Special Concern Crossed by the MVP Southgate Project[a/]

State	County	MP	Waterbody ID	Stream Name	Crossing Method	Source of Concern[b/]	Restricted In-stream Construction Window c/
Virginia	Pittsylvania	0.6	AS-NHD-2317	Little Cherrystone Creek	Dry Crossing	NHD Mussel Stream	Consultations ongoing
Virginia	Pittsylvania	1.9	AS-NHD-2311	Cherrystone Creek	Dry Crossing	NHD Mussel Stream	Consultations ongoing
Virginia	Pittsylvania	5.2	S-E18-3/AS-E18-3	Banister River	Dry Crossing	NHD Mussel Stream	Consultations ongoing
Virginia	Pittsylvania	5.3	S-D18-2	White Oak Creek[d/]	Dry Crossing	NHD Mussel Stream	Consultations ongoing
Virginia	Pittsylvania	8.8	S-E18-14/AS-E18-14	Tributary to White Oak Creek	Dry Crossing	NHD Mussel Stream	Consultations ongoing
Virginia	Pittsylvania	10.1	S-F18-17	White Oak Creek[d/]	Dry Crossing	NHD Mussel Stream	Consultations ongoing
Virginia	Pittsylvania	12.9	AS-NHD-2320	Sandy Creek	Dry Crossing	NHD Mussel Stream	Consultations ongoing
Virginia	Pittsylvania	23.3	S-F18-40/AS-F18-40	Totter's Creek	Dry Crossing	NHD Mussel Stream	Consultations ongoing
North Carolina	Rockingham	27.7	S-A18-40	Cascade Creek	Dry Crossing	NHD Mussel Stream and Potential Occurrence of Protected Mussel and Fish Species (per Agency guidance)	Consultations ongoing
North Carolina	Rockingham	30.2	S-A18-17	Dan River	HDD	NHD Mussel Stream and Potential Occurrence of Protected Mussel and Fish Species (per Agency guidance)	Consultations ongoing
North Carolina	Rockingham	31.1	S-A18-52/AS-A18-52	Rock Creek	Dry Crossing	Potential Occurrence of Protected Mussel Species	Consultations ongoing
North Carolina	Rockingham	32.3	S-A18-147	Machine Creek	Dry Crossing	Potential Occurrence of Protected Mussel Species	Consultations ongoing
North Carolina	Rockingham	32.7	S-A18-151	Town Creek	Dry Crossing	Potential Occurrence of Protected Mussel Species	Consultations ongoing

Table 3.2-2

Fisheries of Special Concern Crossed by the MVP Southgate Project[a/]

State	County	MP	Waterbody ID	Stream Name	Crossing Method	Source of Concern[b/]	Restricted In-stream Construction Window c/
North Carolina	Rockingham	33.1	S-A18-151	Town Creek	Dry Crossing	Potential Occurrence of Protected Mussel Species	Consultations ongoing
North Carolina	Rockingham	38.8	AS-A18-8	Wolf Island Creek	Dry Crossing	NHD Mussel Stream and Potential Occurrence of Protected Mussel and Fish Species (per Agency guidance)	Consultations ongoing
North Carolina	Rockingham	41.2	S-B18-56	Lick Fork	Dry Crossing	Potential Occurrence of Protected Mussel Species	Consultations ongoing
North Carolina	Rockingham	43.3	S-A18-176	Jones Creek	Dry Crossing	Potential Occurrence of Protected Mussel Species	Consultations ongoing
North Carolina	Rockingham	47.1	S-C18-76/AS-C18-76	Hogans Creek	Dry Crossing	Potential Occurrence of Protected Mussel Species	Consultations ongoing
North Carolina	Alamance	63.6	S-B18-16/AS-B18-16	Stony Creek	HDD	Potential Occurrence of Protected Mussel Species	Consultations ongoing
North Carolina	Alamance	64	AS-NHD-1547	Deep Creek	Dry Crossing	Potential Occurrence of Protected Mussel Species	Consultations ongoing
North Carolina	Alamance	67.1	AS-NHD-1558	Boyds Creek	Dry Crossing	Potential Occurrence of Protected Mussel Species	Consultations ongoing

Note: MP listed for access roads is nearest pipeline MP.

a/ Consultations are ongoing with USFWS, VDGIF and NCWRC to determine which waterbodies are to be deemed fisheries of special concern based on potential presence of listed species, including fish, mussels and crayfish. Therefore, this table will be updated to reflect the consultations as they are completed.

b/ Sources of concern include the initial consultation with North Carolina agencies and the waterbodies with potential for mussels (per West Virginia Division of Natural Resources, 2018) based on the National Hydrography Dataset (NHD).

c/ The Project will continue consultation with the agencies to determine applicable avoidance, minimization, or mitigation strategies (i.e. relocation surveys, time of year restrictions) to eliminate or reduce negative impacts to fisheries.

d/ White Oak Creek is crossed in two locations by the proposed pipeline and one proposed access road.

Sources: West Virginia Division of Natural Resources, 2018; Agency Consultations (see Appendix 1-K of Resource Report 1)

Table 3.3-1

Representative List of Wildlife Species with the Potential to Occur Along the MVP Southgate Project Route

Habitat Type	Species Type	Common Name	Scientific Name
Upland Forest	Birds	Acadian Flycatcher	*Empidonax virescens*
		Barred Owl	*Strix varia*
		Black-And-White Warbler	*Mniotilta varia*
		Blue Jay	*Cyanocitta cristata*
		Blue-Headed Vireo	*Vireo solitarius*
		Common Raven	*Corvus corax*
		Great Horned Owl	*Bubo virginianus*
		Hooded Warbler	*Setophaga citrina*
		Ovenbird	*Seiurus aurocapilla*
		Pileated Woodpecker	*Dryocopus pileatus*
		Red-Bellied Woodpecker	*Melanerpes carolinus*
		Red-Shouldered Hawk	*Buteo lineatus*
		Scarlet Tanager	*Piranga olivacea*
	Herpetofauna	Eastern Box Turtle	*Terrapene carolina*
		Northern Copperhead	*Agkistrodon contortrix*
		Spotted Salamander	*Ambystoma maculatum*
		White-Spotted Slimy Salamander	*Plethodon cylindraceus*
		Wood Frog	*Lithobates sylvatica*
	Mammals	Big Brown Bat	*Eptesicus fuscus*
		Eastern Chipmunk	*Tamias striatus*
		Eastern Gray Squirrel	*Sciurus carolinensis*
		Fox Squirrel	*Sciurus niger*
		Eastern Red Bat	*Lasiurus borealis*
		Gray Fox	*Urocyon cinereoargenteus*
		Red Fox	*Vulpes vulpes*
		Striped Skunk	*Mephitis mephitis*
		White-Tailed Deer	*Odocoileus virginianus virginianus*
Scrub-Shrubland	Birds	Eastern Towhee	*Pipilo erythrophthalmus*
		Brown Thrasher	*Toxostoma rufum*
		Cooper's Hawk	*Accipiter cooperii*
		Eastern Screech Owl	*Megascops asio*
		Indigo Bunting	*Passerina cyanea*
		Song Sparrow	*Melospiza melodia*

Table 3.3-1

Representative List of Wildlife Species with the Potential to Occur Along the MVP Southgate Project Route

Habitat Type	Species Type	Common Name	Scientific Name
		White-Eyed Vireo	*Vireo griseus*
		Yellow-Breasted Chat	*Icteria virens*
	Herpetofauna	Northern Black Racer	*Coluber constrictor constrictor*
		Northern Rough Greensnake	*Opheodrys aestivus*
	Mammals	Eastern Cottontail	*Sylvilagus floridanus*
		Red Fox	*Vulpes vulpes*
		White-Footed Mouse	*Peromyscus leucopus*
		White-Tailed Deer	*Odocoileus virginianus virginianus*
Herbaceous Upland	Birds	Eastern Meadowlark	*Sturnella magna*
		American Kestrels	*Falco sparverius*
		Eastern Bluebirds	*Sialia sialas*
		Grasshopper Sparrow	*Ammodramus savannarum*
		Vesper Sparrow	*Pooecetes gramineus*
	Herpetofauna	Eastern Gartersnake	*Thamnophis sirtalis sirtalis*
		Northern Brownsnake	*Storeria dekayi dekayi*
		Milksnake	*Lampropeltis triangulum triangulum*
	Mammals	Groundhog	*Marmota monax*
		Coyote	*Canis latrans*
		Meadow Vole	*Microtus pennsylvanicus*
		Red Fox	*Vulpes vulpes*
		White-Tailed Deer	*Odocoileus virginianus virginianus*
Wetlands	Birds	Common Yellowthroat	*Geothylpis trichas*
		Green Heron	*Butorides virescens*
		Red-Winged Blackbird	*Agelaius phoeniceus*
		Swamp Sparrow	*Melospiza georgiana*
		Tree Swallow	*Tachycineta bicolor*
		Wood Duck	*Aix sponsa*
	Herpetofauna	Spring Peeper	*Pseudocris crucifer*
		Bullfrog	*Lithobates catesbeianus*
		Eastern Painted Turtle	*Chrysemys picta*
		Eastern Red-Spotted Newt	*Notophthalmus viridescens*
		Green Frog	*Lithobates clamitans*
		Snapping Turtle	*Chelydra serpentina*

Table 3.3-1

Representative List of Wildlife Species with the Potential to Occur Along the MVP Southgate Project Route

Habitat Type	Species Type	Common Name	Scientific Name
		Spotted Salamander	*Ambystoma maculatum*
		Upland Chorus Frog	*Pseudacris feriarum*
	Mammals	American Beaver	*Castor canadensis*
		Muskrat	*Ondatra zibethiucs*
		Raccoon	*Procyon lotor*
		Virginia Opossum	*Didelphis virginiana*
		White-Tailed Deer	*Odocoileus virginianus virginianus*
Agricultural Lands	Birds	Brown-Headed Cowbird	*Molothrus ater*
		Barn Swallow	*Hirundo rustica*
		Hooded Merganser	*Lophodytes cucullatus*
		Horned Lark	*Eremophila alpestris*
		Lesser Scaup	*Aythya affinis*
		Mourning Dove	*Zenaida macroura*
		Ring-Necked Duck	*Aythya collaris*
	Herpetofauna	Eastern Ratsnake	*Pantherophis alleghaniensis*
	Mammals	Deer Mice	*Peromyscus maniculatus*
		Groundhog	*Marmota monax*
		Raccoon	*Procyon lotor*
		White-Tailed Deer	*Odocoileus virginianus virginianus*

Table 3.3-2

Significant or Sensitive Wildlife Habitats within One Mile of the MVP Southgate Project

County / State	Milepost	Name of Area	Land Ownership/ Management	Construction Impact (acres)	Operation Impact (acres)	Habitat Types Affected	Comments
Pittsylvania, VA	0	Transco Road Net Conservation Site	VDCR	0.0	0.0	N/A	Easement direct adjacent to route. Impacts have been avoided.
Pittsylvania, VA	14.3	VA Conservation Easements	VA Outdoors Foundation	0.0	0.0	N/A	MVP proposes to utilize an existing access road on the edge of this easement area. No impacts are anticipated
Rockingham, NC	26.3 to 36.4	Forest Legacy Areas: Northern Tier / Roanoke River / Great Dismal Swamp	NC Forest Service - voluntary management with landowners	344.3	104.6	Various	Forest clearing has been reduced to the extent practicable. Any landowners active in the Forest Legacy Program will be identified by the Project.
Rockingham, NC	30.2	ROA/Dan River Aquatic Habitat	Public Waters	0.0	0.0	Riverine	The Dan River has been ranked as exceptional for containing high quality examples of globally ranked species and habitats. The Dan River is proposed to be crossed utilizing HDD and therefore, no impacts are anticipated.
Rockingham, NC	37.8	Piedmont Land Conservancy Easement	Piedmont Land Conservancy	0.0	0.0	N/A	Easement direct adjacent to route. Impacts have been avoided.
Rockingham, NC	42.2 to 48.4	Forest Legacy Areas: Northern Tier / Roanoke River / Great Dismal Swamp	NC Forest Service - voluntary management with landowners	10.8	0.0	Various	Forest clearing has been reduced to the extent practicable. Any landowners active in the Forest Legacy Program will be identified by the Project.
Alamance, NC	64.9	NC Natural Areas: Stony Creek Forest	Private	0.1	0.0	Small portion of forest edge along road.	Area potentially has globally ranked species (R5?), however ranking is not final.

Sources:
Consultation with VDCR-DNH and NCNHP (see Appendix 1-K of Resource Report 1; NCFS, 2010; NCNHP, 2018 and VDCR-DNH, 2017.

Table 3.3-3

Project Migratory Bird Species of Concern

Common Name	*Scientific Name*	Source /a	Project County /b	eBird Occurrence /c		MBSC /d	Rationale
				Within 5 mi	Within 10 mi		
American black duck	*Anas rubripes*	ACJV; VaFWIS (IIa)	none	8	20	No	No records of nesting near Project.
American woodcock	*Scolopax minor*	ACJV; VaFWIS (IIa)	Pittsylvania; Rockingham; Alamance	11	49	Yes	Conservation status and known documented records near Project warrant species inclusion.
Bachman's sparrow	*Peucaea aestivalis*	BCR 29	none	0	0	No	No records of species near Project.
bald eagle	*Haliaeetus leucocephalus*	IPaC; BGEPA; BCR 29	none	32	277	Yes	Species is included due to BGEPA. *No documented nests or concentration areas near Project (accessed online mapping tools on July 18, 2018).
Bewick's wren	*Thryomanes bewickii*	BCR 29	none	0	0	No	No records of species near Project.
black rail	*Laterallus jamaicensis*	BCR 29; ACJV	none	0	0	No	No records of species near Project.
blue-winged warbler	*Vermivora cyanoptera*	IPaC; BCR 29	none	1	8	No	Species nests farther to west in mountainous region. No documented occurrences (eBird) during nesting season (May to August).
brown-headed nuthatch	*Sitta pusilla*	BCR 29; ACJV	Rockingham; Alamance	214	733	Yes	Conservation status and known documented records near Project warrant species inclusion.
cerulean warbler	*Setophaga cerulea*	IPaC; BCR 29; VaFWIS (IIa)	none	1	1	No	Species nests farther to west in mountainous region. Rare nesting to east in NC. No documented occurrences (eBird) during nesting season (May to August).

Table 3.3-3

Project Migratory Bird Species of Concern

Common Name	*Scientific Name*	Source /a	Project County /b	eBird Occurrence /c		MBSC /d	Rationale
				Within 5 mi	Within 10 mi		
chimney swift	*Chaetura pelagica*	ACJV	Pittsylvania; Rockingham; Alamance	628	1,027	No	Species nests primarily in chimneys. Project impacts are unlikely to affect species.
eastern whip-poor-will	*Antrostomus vociferus*	IPaC; BCR 29; ACJV	Pittsylvania	4	37	Yes	Conservation status and known documented records near Project warrant species inclusion.
field sparrow	*Spizella pusilla*	ACJV	Pittsylvania; Rockingham; Alamance	330	600	No	While the species is considered a 'High' priority bird by the ACJV in BCR 29, its decline is likely associated with conversion of open/early successional habitat to other land cover types. Construction of the proposed Project will result in an increase in suitable land cover types for nesting.
grasshopper sparrow	*Ammodrammus savannarum*	ACJV; NCNHP	Pittsylvania; Rockingham; Alamance	180	241	Yes	Conservation status in NC and known documented records near Project warrant species inclusion.
Henslow's sparrow	*Ammodrammus henslowii*	BCR 29	none	0	0	No	No known nesting records near Project. State databases did not reveal records of species near Project.
Kentucky warbler	*Geothlypis formosa*	IPaC; BCR 29; ACJV	none	3	9	Yes	Conservation status and known documented records near Project warrant species inclusion.
king rail	*Rallus elegens*	ACJV; VaFWIS	none	0	0	No	VaFWIS identified species; however, the Wildlife and Environmental Review Map Service (WERMS) did not identify known records of the species. No documented

Table 3.3-3

Project Migratory Bird Species of Concern

Common Name	*Scientific Name*	Source /a	Project County /b	eBird Occurrence /c		MBSC /d	Rationale
				Within 5 mi	Within 10 mi		
							occurrences near Project via eBird.
loggerhead shrike	*Lanius ludovicianus*	BCR 29; VaFWIS; NCNHP	Former breeder in Rockingham and Alamance	1	2	No	No records during nesting season. Conservation status and positive results from reviews of state databases.
northern bobwhite	*Colinus virginiana*	ACJV	Pittsylvania; Rockingham; Alamance	67	98	Yes	Conservation status and known documented records near Project warrant species inclusion.
peregrine falcon	*Falco peregrinus*	BCR 29	none	5	6	No	No known nesting records near Project. State databases did not reveal records of species near Project.
prairie warbler	*Setophaga discolor*	IPaC; BCR 29; ACJV	Pittsylvania; Rockingham; Alamance	30	113	Yes	Conservation status and known documented records near Project warrant species inclusion.
prothonotary warbler	*Protonotaria citrea*	IPaC; ACJV (Moderate)	Rockingham; Alamance	34	102	Yes	Conservation status and known documented records near Project warrant species inclusion.
red-cockaded woodpecker	*Picoides borealis*	ACJV	none	0	0	No	Species does not occur in region.
red-headed woodpecker	*Melanerpes erythrocephalus*	IPaC; ACJV (Moderate)	Rockingham; Alamance	55	208	Yes	Conservation status and known documented records near Project warrant species inclusion.
ruffed grouse	*Bonasa umbellus*	ACJV	none	0	0	No	Species occurs farther to west in mountainous region. No documented occurrences (eBird).
rusty blackbird	*Euphagus carolinus*	IPaC; BCR 29	n/a	11	38	No	Species does not nest in region.
sedge wren	*Cistothorus platensis*	BCR 29	none	0	0	No	No known records near Project.

Table 3.3-3

Project Migratory Bird Species of Concern

Common Name	*Scientific Name*	Source /a	Project County /b	eBird Occurrence /c		MBSC /d	Rationale
				Within 5 mi	Within 10 mi		
short-eared owl	*Asio flammeus*	BCR 29	n/a	0	2	No	Species does not nest in region.
Swainson's warbler	*Limnothlypis swainsonii*	BCR 29	none	0	0	No	No known records near Project.
upland sandpiper	*Bartramia longicauda*	ACJV	none	0	0	No	No known records near Project.
willow flycatcher	*Empidonax trailii*	NCNHP	Rockingham	5	8	Yes	Conservation status in NC and records near Project warrant inclusion.
wood thrush	*Hylocichla mustelina*	IPaC; BCR 29; ACJV	Pittsylvania; Rockingham; Alamance			Yes	Conservation status and known documented records near Project warrant species inclusion.
yellow-crowned night-heron	*Nyctanassa violacea*	VaFWIS	none	0	0	No	While VaFWIS identified species, the Wildlife and Environmental Review Map Service (WERMS) did not reveal any known records of the species. No documented occurrences near Project via eBird.

NOTES
a/ IPaC = Unofficial list from United States Fish and Wildlife Service's Information for Planning and Consultation (IPaC) system; note that no species is included as a Project-specific MBSC based solely on unofficial IPaC results; BCR 29 =Included as 2008 Bird of Conservation Concern for Bird Conservation Region 29 (Piedmont); ACJV = Considered a 'Highest' or 'High' priority species in Atlantic Coast Joint Venture's 2014 Piedmont BCR 29 Implementation Plan. Two species (i.e., prothonotary warbler and red-headed woodpecker) with 'Moderate' priority status were included; Sources: http://acjv.org/documents/piedmont-2014.pdf; VaFWIS = Virginia Fish and Wildlife Information Service. Includes Species of Greatest Conservation Need ranked as tier I or II with positive results for records; NCNHP = North Carolina Natural Heritage Program's database; BGEPA = Bald and Golden Eagle Protection Act.
b/ VA Source: Includes species with breeding status of 'Confirmed' and 'Probable' in the First Virginia Breeding Bird Atlas Survey (1985-1989); Second Virginia Breeding Bird Atlas currently in progress. NC Source: Birds of North Carolina: their Distribution and Abundance, http://ncbirds.carolinabirdclub.org/index.html
c/ eBird's online mapping tool was accessed on July 31, 2018 to identify records of potential MBSC from January 1, 1998 to May 31, 2018. Results in a submitted list that include species of interest, and should not be interpreted as number of individuals observed.
d/ MBSC – migratory bird species of concern

Table 3.3-4

Preferred Nesting Habitat and Primary Nesting Season of Project-specific Migratory Bird Species

Species		Preferred Nesting Habitat	Primary Nesting Season
Common	**Scientific**		
American woodcock	*Scolopax minor*	Habitat consists of young forests and abandoned farmland mixed with forested land. Generally considered an edge species.	Apr. 1 to Aug. 31
bald eagle	*Haliaeetus leucocephalus*	Nests in trees among forests adjacent to large water bodies	Jan. 1 to Aug. 31
brown-headed nuthatch	*Sitta pusilla*	Mature and open longleaf pine stands; at least locally common in open loblolly, shortleaf, and pond pine stands, less so in Virginia pine. In the Piedmont, birds favor thinned or more open pine stands, such as in residential areas, golf courses, margins of lakes and ponds, and edges.	Apr 15 to Aug. 15
eastern whip-poor-will	*Antrostomus vociferus*	Forests and woodlands; no nest built, eggs laid on flat ground.	May 1 to Aug. 15
grasshopper sparrow	*Ammodrammus savannarum*	Fallow fields, pastures, hayfields, grasslands, and other areas dominated by graminoid vegetation.	May 15 to Aug. 15
Kentucky warbler	*Geothlypis formosa*	Prefers deep shaded woods with dense, humid thickets, bottomlands near creeks and rivers, ravines in upland deciduous woods, and edges of swamps; nests on ground or within a few inches of it	May 1 to Aug. 15
northern bobwhite	*Colinus virginiana*	Fallow fields, pastures, hayfields, grasslands, and other areas dominated by graminoid vegetation	Apr 15 to Aug. 31
prairie warbler	*Setophaga discolor*	Shrubby pastures, low pines; nest usually in a tree (such as pine, cedar, sweet-gum, oak), 1-45' above the ground	May 1 to Jul 31
prothonotary warbler	*Protonotaria citrea*	Wooded swamps, wetlands, river bottom hardwoods; Nest site usually 5-10' up (sometimes 3-30' up), above standing water in hole in tree or stump.	May 15 to Jul 31
red-headed woodpecker	*Melanerpes erythrocephalus*	Groves, farm country, orchards, shade trees in towns, large scattered trees; nests in tree cavities	May 10 to Sep. 10
wood thrush	*Hylocichla mustelina*	Mainly deciduous woodlands; nest placed in vertical fork of tree (usually deciduous) or saddled on horizontal branch, usually about 10-15' above the ground, sometimes lower, rarely as high as 50'.	May 1 to Aug.31
willow flycatcher	*Empidonax trailii*	Open country, mainly in wide valleys with streamside thickets and corridors of trees adjacent to fields; marshes with shrubs and small trees	June 1 to Aug. 15

Table 3.4-1

Vegetation Acreage Affected by Construction and Operation of the MVP Southgate Project

Facility County, State	Agricultural a/		Forested/Woodland						Upland Herbaceous / Scrub Shrub b/		Wetlands c/			
			Deciduous		Evergreen		Mixed				Herbaceous / Scrub Shrub Wetlands		PFO Wetlands	
	Construction d/	Operation e/	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation
Pipeline ROWe/	**114.9**	**58.5**	**327.6**	**178.3**	**52.4**	**26.8**	**18.0**	**8.3**	**285.6**	**145.6**	**4.8**	**0.6**	**12.9**	**4.7**
Pittsylvania, VA	49.9	25.3	105.6	54.6	12.1	5.4	8.6	3.6	119.8	64.5	0.7	0.1	5.6	1.7
Rockingham, NC	35.3	18.6	126.9	72.0	23.6	12.2	5.6	3.0	95.0	45.3	3.4	0.4	3.6	1.5
Alamance, NC	29.7	14.6	95.1	51.7	16.7	9.2	3.8	1.7	70.7	35.7	0.8	0.1	3.7	1.5
Additional Temporary Workspace (ATWS)	**35.4**	**0.0**	**86.6**	**0.0**	**15.8**	**0.0**	**4.4**	**0.0**	**78.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Pittsylvania, VA	10.1	0.0	28.2	0.0	2.9	0.0	2.1	0.0	25.9	0.0	0.0	0.0	0.0	0.0
Rockingham, NC	16.5	0.0	34.9	0.0	8.3	0.0	1.7	0.0	27.1	0.0	0.0	0.0	0.0	0.0
Alamance, NC	8.9	0.0	23.5	0.0	4.6	0.0	0.6	0.0	25.6	0.0	0.0	0.0	0.0	0.0
Cathodic Protection	**0.5**	**0.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.6**	**0.6**	**1.2**	**1.2**	**0.0**	**0.0**	**0.0**	**0.0**
Pittsylvania, VA	0.5	0.5	0.0	0.0	0.0	0.0	0.6	0.6	0.1	0.1	0.0	0.0	0.0	0.0
Rockingham, NC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.0	0.0	0.0	0.0
Alamance, NC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.0	0.0	0.0	0.0
Permanent Aboveground Facilities	**12.6**	**1.6**	**18.4**	**6.5**	**0.4**	**0.4**	**5.0**	**0.0**	**7.6**	**2.2**	**0.5**	**0.2**	**0.5**	**0.5**
Pittsylvania, VA	12.6	1.6	2.2	2.2	0.0	0.0	5.0	0.0	1.6	0.5	0.0	0.0	0.0	0.0
Rockingham, NC	0.0	0.0	16.1	4.2	0.4	0.4	0.0	0.0	5.5	1.2	0.4	0.1	0.5	0.5
Alamance, NC	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.5	0.5	0.1	0.1	0.0	0.0

Table 3.4-1

Vegetation Acreage Affected by Construction and Operation of the MVP Southgate Project

Facility County, State	Agricultural a/		Forested/Woodland						Upland Herbaceous / Scrub Shrub b/		Wetlands c/			
			Deciduous		Evergreen		Mixed				Herbaceous / Scrub Shrub Wetlands		PFO Wetlands	
	Construction d/	Operation e/	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation
Contractor Yards	**5.8**	**0.0**	**28.0**	**0.0**	**18.7**	**0.0**	**1.8**	**0.0**	**134.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Pittsylvania, VA	0.0	0.0	16.8	0.0	18.7	0.0	1.8	0.0	25.2	0.0	0.0	0.0	0.0	0.0
Rockingham, NC	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	65.7	0.0	0.0	0.0	0.0	0.0
Guilford, NC	0.0	0.0	4.9	0.0	0.0	0.0	0.0	0.0	10.5	0.0	0.0	0.0	0.0	0.0
Alamance, NC	5.8	0.0	5.3	0.0	0.0	0.0	0.0	0.0	32.7	0.0	0.0	0.0	0.0	0.0
Temporary and Permanent Access Roads f/	**21.6**	**0.7**	**16.5**	**0.4**	**2.5**	**0.0**	**2.1**	**0.0**	**85.3**	**3.4**	**0.5**	**0.0**	**0.1**	**0.0**
Pittsylvania, VA	9.2	0.7	9.4	0.1	0.6	0.0	1.6	0.0	41.5	0.8	0.2	0.0	0.1	0.0
Rockingham, NC	7.0	0.0	4.9	0.0	1.1	0.0	0.2	0.0	33.9	1.8	0.2	0.0	0.0	0.0
Alamance, NC	5.5	0.0	2.2	0.3	0.8	0.0	0.3	0.0	9.9	0.8	0.1	0.0	0.0	0.0
TOTAL	**190.8**	**61.2**	**477.1**	**185.2**	**89.8**	**27.2**	**31.9**	**8.9**	**592.4**	**152.4**	**5.8**	**0.8**	**13.5**	**5.2**

NOTE: Sums of addends may not equal totals due to rounding.

a/ Cultivated land (e.g., tobacco, soybeans, hay, corn).

b/ Includes grassland

c/ Includes data from field delineation where access is available and NWI where survey access not available.

d/ Construction acres includes the area affected by construction (i.e., temporary and additional temporary workspace, contractor yards, and access roads) and the area affected by operation of the Project (i.e., facility operation footprint and 50-foot pipeline permanent right-of-way). The 50-foot-wide permanent ROW between horizontal directional drill entry and exit points are not included in this acreage.

e/ Includes only the operation footprint of the Project facilities and the permanently maintained 50-foot-wide pipeline right-of-way in uplands. The 50-foot-wide permanent ROW between horizontal directional drill entry and exit points are not included in this acreage. In wetlands, operational vegetation impacts for PEM and PSS wetlands include a 10-foot wide vegetation maintenance corridor; operational vegetation maintenance impacts for PFO wetlands include a 30-foot-wide vegetation maintenance corridor (i.e., 10-foot-wide cleared corridor and selective removal of trees within 15 feet of the pipeline).

Table 3.4-2

Significant or Sensitive Vegetation Areas Within the One-Mile of the MVP Southgate Project

Species/Community	County	Consulting Agency	Survey Status	Proposed Avoidance or Minimization
Piedmont Barbara's-button	Pittsylvania, VA	VDCR	Habitat assessment and consultation ongoing to determine survey effort.	If populations encountered, populations will be mapped and, where avoidance of impact is feasible, will be marked and protected. Populations will be reported to the VDCR.
Downy phlox	Pittsylvania, VA	VDCR	Habitat assessment and consultation ongoing to determine survey effort.	If populations encountered, populations will be mapped and, where avoidance of impact is feasible, will be marked and protected. Populations will be reported to the VDCR
American Bluehearts	Pittsylvania, VA	VDCR	Habitat assessment and consultation ongoing to determine survey effort.	Appropriate habitat lacking within the Project. No impact expected.
Cliff Stonecrop	Rockingham, NC	NCNHP	Habitat assessment and consultation ongoing to determine survey effort.	If populations encountered, populations will be mapped and, where avoidance of impact is feasible, will be marked and protected. Populations will be reported to the VDCR
Dry-Mesic Oak-Hickory Forest (Piedmont Subtype)	Rockingham and Alamance, NC	NCNHP	Not Applicable	The Project has collocated with existing easement and will follow FERC guidance to minimize forested impacts.
Mesic Mixed Hardwood Forest (Piedmont Subtype)	Rockingham and Alamance, NC	NCNHP	Not Applicable	The Project has collocated with existing easement and will follow FERC guidance to minimize forested impacts.
Wide Mouth Creek Conglomerate Exposure	Rockingham, NC	NCNHP	Not Applicable	Outside of Project Area. No impact expected.
Rocky Branch Conglomerate Exposure	Rockingham, NC	NCNHP	Not Applicable	Outside of Project Area. No impact expected.
NC Clean Water Management Trust Fund Easement	Alamance, NC	NCNHP	Not Applicable	Outside of Project Area. No impact expected.
NC Division of Mitigation Services Easement	Alamance, NC	NCNHP	Not Applicable	Outside of Project Area. No impact expected.
Mountains-to-Sea Trail	Alamance, NC	NCNHP	Not Applicable	Outside of Project Area. No impact expected.

Sources:
Consultation with VDCR-DNH and NCNHP (see Appendix 1-K of Resource Report 1); NCNHP, 2018 and VDCR-DNH, 2017.

Table 3.5-1

Federally and State-Listed Fish, Plant, and Wildlife Species with the Potential to Occur Along the MVP Southgate Project Route

Common Name	Scientific Name	Status			Survey Locations and Status
		Federal a/	VA b/	NC b/	
Arthropods					
Carolina ladle crayfish	*Cambarus davidi*			SR	The Project expects to conduct desktop assessment for potential suitable habitat by mid-September and will continue consultations with NRWRC to determine survey effort. No surveys are expected to be required in Virginia.
Greensboro burrowing crayfish	*Cambarus catagius*			SC	
Amphibians					
Four-toed salamander	*Hemidactylium scutatum*			SC	The Project expects to conduct desktop assessment for potential suitable habitat by mid-September and will continue consultations with NRWRC to determine survey effort. No surveys are expected to be required in Virginia.
Mole salamander	*Ambystoma talpoideum*		W(II)	SC	
Fish					
Cape Fear shiner	*Notropis mekistocholas*	E d/		E d/	The Project expects to submit survey protocols in August and surveys to be completed by November 15. Targeted surveys are not required in North Carolina.
Riverweed Darter	*Etheostoma podostemone*			SC	
Roanoke logperch	*Percina rex*	E	E	E	
Mammals					
Eastern big-eared bat	*Corynorhinus rafinesquii macrotis*	SC d/	E d/	SC d/	See Appendix 3-A of this Resource Report for the approved Bat Survey Study Plan. Bat surveys concluded August 2018; results will be reported to agencies for review and comment and filed with the FERC.
Eastern red bat	*Lasiurus borealis*		W(IV)		
Eastern small-footed bat	*Myotis leibii*	SC d/	W(I) d/	SC d/	
Florida yellow bat	*Lasiurus intermedius floridanus*			SC d/	
Gray bat	*Myotis grisescens*	E d/	E d/	E d/	
Hoary bat	*Lasiurus cinereus*		W(IV)		
Indiana Bat	*Myotis sodalis*	E d/	E d/	E d/	
Little brown bat	*Myotis lucifugus*		E d/		
Northern Long-eared bat	*Myotis septentrionalis*	T	T	SR	
Rafinesque's big-eared bat	*Corynorhinus rafinesquii rafinesqui*	SC d/	E d/	T d/	
Silver-haired bat	*Lasionycteris noctivagans*		W(IV)		
Southeastern bat	*Myotis austroriparius*	SC d/	W(I) d/	SC d/	
Tricolored bat	*Perimyotis subflavus*		E d/		
Virginia big-eared bat	*Corynorhinus townsendii virginianus*	E d/	E d/	E d/	

Table 3.5-1

Federally and State-Listed Fish, Plant, and Wildlife Species with the Potential to Occur Along the MVP Southgate Project Route

Common Name	Scientific Name	Status			Survey Locations and Status
		Federal a/	VA b/	NC b/	
Mussels					
Atlantic pigtoe	*Fusconaia masoni*	SC[d/]	T[d/]	E[d/]	The Project expects to submit survey protocols by mid-August 2018 and surveys to be conducted by November 15, 2018.
Eastern Creekshell	*Villosa delumbis*			SR	
Eastern Lampmussel	*Lampsilis radiata*			T	
Green Floater	*Lasmigona subviridis*	SC	T	E	
James Spinymussel	*Parvaspina collina*	E	E[d/]	E	
Yellow Lampmussel	*Lampsilis cariosa*	SC	W(II)	E	
Yellow Lance	*Elliptio lanceolata*	T[d/]		E[d/]	
Plants					
American Bluehearts	*Buchnera americana*		R		No suitable habitat present within the Project area. No survey required.
Cliff Stonecrop	*Sedum glaucophyllum*			SR	No suitable habitat present within the Project area. No survey required.
Downy phlox	*Phlox pilosa*		R		Potential habitat surveys are ongoing. Presence/absence surveys will be conducted as necessary.
Piedmont Barbara's-button	*Marshallia obovate var. obovate*		R		Potential habitat surveys are ongoing. Presence/absence surveys will be conducted as necessary.
Small whorled pogonia	*Isotria medeoloides*	T	E[d/]	T	Surveys have been initiated in North Carolina and will be completed by mid-September 2018. No individuals have been observed to-date. No surveys are required in Virginia.
Smooth coneflower	*Echinacea laevigata*	E	T[d/]	E	Surveys will be initiated in North Carolina in August 2018 and completed by mid-September 2018. No surveys are required in Virginia.

a/ Federal Status. E = Listed Endangered; T = Listed Threatened; SC = Species of Concern, a list maintained by USFWS Raleigh Field Office

b/ Virginia Status. E = Listed Endangered; T = Listed Threatened; R = Rare, including both Critically Imperiled and Imperiled state ranking; W (I) = Wildlife Action Plan, Tier I; W (II) = Wildlife Action Plan, Tier I; W (III) = Wildlife Action Plan, Tier III; W (IV) = Wildlife Action Plan, Tier IV

c/ North Carolina Status. E = Listed Endangered; T = Listed Threatened; SC = Species of Special Concern; SR = Significantly Rare

d/ Species not known to occur within the Project area (by State).

Sources: Townsend, 2018; Roble, 2016; NCNHP, 2016; and NCNHP, 2017

MVP Southgate Project

Docket No. PF18-4-000

Draft Resource Report 3

Appendix 3-A
Agency-Approved Rare Species Survey Plans

(Provided Under Separate Cover)

MVP Southgate Project

Docket No. PF18-4-000

Draft Resource Report 3

Appendix 3-B
Exotic and Invasive Species Control Plan

[*Not Included with this Draft*]