

# INTERSTATE 395 EXPRESS LANES NORTHERN EXTENSION

## NATURAL RESOURCES

TECHNICAL REPORT | SEPTEMBER 2016



ExpressLanes



# INTERSTATE 395 EXPRESS LANES NORTHERN EXTENSION

## Natural Resources Technical Report

City of Alexandria, and Arlington and Fairfax Counties  
Project Number: 0395-969-205, P101; UPC: 108313  
Federal Project Number: NHPP-395-4(189)

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## List of Acronyms

BMP	Best Management Practice
CFR	Code of Federal Regulations
CWA	Clean Water Act
EA	Environmental Assessment
EO	Executive Order
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
HOT	High Occupancy Toll
HOV	High Occupancy Vehicle
HUC	Hydrologic Unit Code
I-395	Interstate 395
IPaC	Information for Planning and Conservation
JD	Jurisdictional Determination
NCHRP	National Cooperative Highway Research Program
NEPA	National Environmental Policy Act
NFW	National Wildlife Federation
NHS	National Highway System
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
RMA	Resource Management Area
RPA	Resource Protection Area
STRAHNET	Strategic Highway Network
SWM	Stormwater Management

SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Maximum Daily Load
UPC	Universal Project Code
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
VAC	Virginia Administrative Code
VAFWIS	Virginia Fish and Wildlife Information Service
VDACS	Virginia Department of Agriculture and Consumer Services
VDCR	Virginia Department of Conservation and Recreation
VDCR-DNH	Virginia Department of Conservation and Recreation Department of Natural Heritage
VDEQ	Virginia Department of Environmental Quality
VDGIF	Virginia Department of Game and Inland Fisheries
VDOT	Virginia Department of Transportation
VMRC	Virginia Marine Resources Commission
VSMP	Virginia Stormwater Management Program
VPDES	Virginia Pollutant Discharge Elimination System
WERMS	Wildlife Environmental Review Map Service
WNS	White Nose Syndrome
WOUS	Waters of the United States

## 1. INTRODUCTION

The Virginia Department of Transportation (VDOT), in cooperation with the Federal Highway Administration (FHWA), has initiated a study for the Interstate 395 (I-395) Express Lanes Project (Northern High Occupancy Toll [HOT] Lanes) to extend the I-95 Express Lanes in the City of Alexandria, and Arlington, and Fairfax Counties, Virginia. Pursuant to the National Environmental Policy Act of 1969, as amended (NEPA), and in accordance with FHWA regulations, an Environmental Assessment (EA) has been prepared to analyze and document the potential social, economic, and environmental effects associated with the proposed transportation improvements.

The purpose of this Technical Report is to identify and assess the impact to natural resources within the study area. Information in this report, described below, supports discussions presented in the EA.

- **Section 1** provides an overview of the study and purpose and need of the project;
- **Section 2** describes the wetlands and waters of the U.S. within the study area and evaluates the potential for impact;
- **Section 3** describes the navigable waters within the study area and evaluates the potential for impacts;
- **Section 4** describes the Chesapeake Bay Preservation Act and evaluates the potential for impacts;
- **Section 5** describes the erosion and sediment control measures that would be required;
- **Section 6** describes the water quality within the study area and evaluates the potential for impacts;
- **Section 7** describes the floodplains within the study area and evaluates the potential for impacts;
- **Section 8** describes the threatened, endangered, and special status species and evaluates the potential for impacts;
- **Section 9** describes the invasive species within the study area and evaluates the potential for impacts;
- **Section 10** describes the wildlife habitat within the study area and evaluates the potential for impact; and,
- **Section 11** describes the permits that would be required.

### 1.1 DESCRIPTION OF THE STUDY AREA

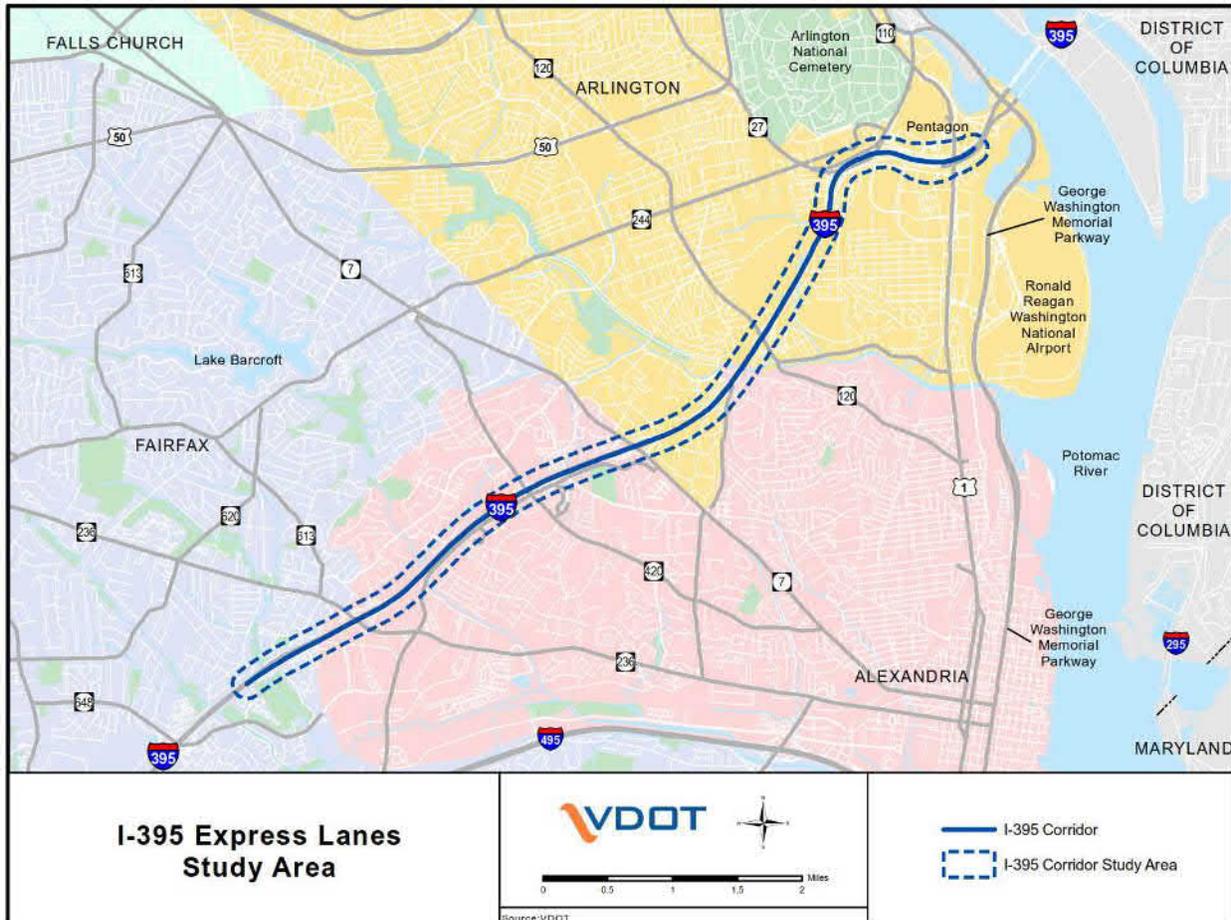
The study area encompasses approximately eight miles of the I-395 corridor from Turkeycock Run in Fairfax County to the vicinity of Eads Street near the Pentagon in Arlington County, as shown in **Figure 1-1**. Transition areas extending slightly beyond these termini are included in order to connect the proposed improvements with the existing facility on either end. Additional signage, maintenance of traffic, and noise barrier activities are anticipated to occur beyond the study area. Crossroads and interchange areas also are included in the study area, as well as lands adjacent to the corridor<sup>1</sup>. The following interchanges along I-395 are located within the study area, moving south to north:

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<sup>1</sup> The study area is approximately 600 feet to either side of the existing corridor for a distance of eight miles. The study area was established to identify the full extent of environmental resources and their relevance to the project. Specific potential environmental consequences resulting from the expansion and conversion of the two existing reversible High Occupancy Vehicle (HOV) lanes on I-395 to three managed HOT lanes are documented in **Chapter 3.0, Environmental Consequences** of the EA.

- Turkeycock Run;
- Duke Street/Little River Turnpike (Route 236);
- Seminary Road (Route 420);
- King Street (Route 7);
- Shirlington Road;
- Glebe Road (Route 120);
- Washington Boulevard (Route 27); and
- Eads Street near the Pentagon.

Figure 1-1: Study Area



## 1.2 BACKGROUND

In 1995, the Public-Private Transportation Act (PPTA) was signed into law and was amended and re-enacted in 2005. PPTA allows for private entities to solicit VDOT to develop and/or operate and maintain transportation facilities that VDOT determines demonstrate a need. In November 2005, the conceptual proposal submitted by Fluor and Transurban was selected by the PPTA Advisory Panel. As proposed at that time, the project improvements would expand the High Occupancy Vehicle (HOV) system in the I-95 / I-395 corridor and apply the HOT concept. As a result of this action, VDOT, in cooperation with FHWA, initiated an environmental analysis on the following proposal:

- Convert the existing two-lane HOV facility to three HOT lanes along I-395 from Eads Street to just south of Route 234 Interchange near Dumfries;
- Construct two new HOT lanes in the median from the existing terminus south of Route 234 to just north of Route 610 (Garrisonville Road);
- Add new entry/exit points between the general purpose lanes and the HOT lanes and modify existing entry/exit points; and
- Build new structures associated with the Lorton Bus-rail transfer station, flyovers, and replace existing structures at Telegraph Road over I-95 and the Franconian-Springfield pedestrian bridge.

In January 2009, FHWA issued a Categorical Exclusion (CE) for the project. In February 2011, VDOT reduced the project scope by eliminating approximately six miles of HOT lanes on I-395 including modifications to the existing interchanges, instead, focusing traffic improvements on the I-95 corridor. VDOT then announced plans for a new I-95 HOT Lanes Project and prepared an EA and then a Revised EA to assess HOT lanes on I-95 from Garrisonville Road in Stafford County to I-395 at Edsall Road in Fairfax County and link those lanes directly to the new I-495 HOT lanes already under construction. In December 2011, upon review of the Revised EA and supporting documentation, FHWA issued a Finding of No Significant Impact.

In 2012, VDOT and 95 Express Lanes, LLC (95 Express) entered into a Comprehensive Agreement for the development of the I-95 Express Lanes. The I-95 Express Lanes project was completed in December 2014. The Comprehensive Agreement allows for the future development of the extension of the I-95 Express Lanes along the I-395 corridor similar to the limits originally proposed in 2005. In 2015, the VDOT signed a Development Framework Agreement with 95 Express to extend the I-395 Express Lanes as a Concessionaire's Enhancement under the Comprehensive Agreement. The Development Framework Agreement outlines the responsibilities of both VDOT and the Concessionaire. The Agreement notes that improvements would be built largely within VDOT's existing right of way, VDOT and 95 Express would work together to finalize the scope, finance plan and agreement, and 95 Express would fund an annual transit payment.

### 1.3 EXISTING CONDITIONS

The I-395 corridor begins at the I-95 / I-495 Capital Beltway Interchange and ends at the New York Avenue NW (Route 50) intersection in northwest Washington, D.C, an approximate distance of 14 miles. I-395 is part of the National Highway System (NHS)<sup>2</sup> and the Strategic Highway Network (STRAHNET)<sup>3</sup>. Additionally, I-395 is the primary north-south interstate into Washington, D.C. from Virginia serving local, commuter, and regional traffic. The existing I-395 facility within the study limits generally includes four northbound and four southbound general purpose lanes and two reversible HOV lanes between the northbound and southbound general purpose lanes. The HOV lanes operate in the northbound direction between 2:30 AM and 11:00 AM with HOV 3+ restrictions in effect from 6:00 AM to 9:00 AM. The HOV lanes operate in the southbound direction from 1:00 PM to 12:00 AM with HOV 3+ restrictions in effect

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<sup>2</sup> NHS consists of major roadways important to the nation's economy, defense, and mobility. The NHS includes the interstate highway system as well as other roads connecting to major ports, airports, public transportation facilities, or other intermodal transportation services ([http://www.fhwa.dot.gov/planning/national\\_highway\\_system/](http://www.fhwa.dot.gov/planning/national_highway_system/)).

<sup>3</sup> STRAHNET is a system of highways important to the United States' strategic defense policy providing defense access, continuity and emergency capabilities for defense purposes ([http://www.fhwa.dot.gov/planning/national\\_highway\\_system/](http://www.fhwa.dot.gov/planning/national_highway_system/)).

from 3:30 PM to 6:00 PM. During the summer months, the midday closure of the reversible HOV lanes to reverse the lanes from northbound to southbound travel occurs one hour earlier, beginning at 10:00 AM to accommodate higher traffic demands in both the general purpose, HOV, and Express Lanes. Nighttime closures remain the same during the summer months.

## 1.4 PURPOSE AND NEED

The Purpose and Need includes consideration of both the base year 2015 and future year 2040 conditions along the I-395 Corridor. Based on the background information discussed above, information gathered during public and agency meetings, and the analysis of recent data collected for this study, the following transportation needs have been identified for the study area:

- Reduce congestion;
- Provide additional travel choices;
- Improve travel reliability; and
- Improve roadway safety.

## 1.5 DESCRIPTION OF THE ALTERNATIVES

VDOT and 95 Express have been involved in discussions, reviews, and decisions related to HOT Lanes proposals in the I-95/I-395 corridor since 2004. The alternatives development process for this project was shaped by this early coordination between VDOT and 95 Express, the initial project proposal concept and previously completed NEPA documentation and technical studies. The No Build Alternative and the Build Alternative are under consideration for the EA.

### No Build Alternative

The No Build Alternative would retain the existing I-395 interstate and associated interchanges in their present configurations, and allow for routine maintenance and safety upgrades, but assumes no major improvements to the I-395 corridor with the exception of the previously committed projects.

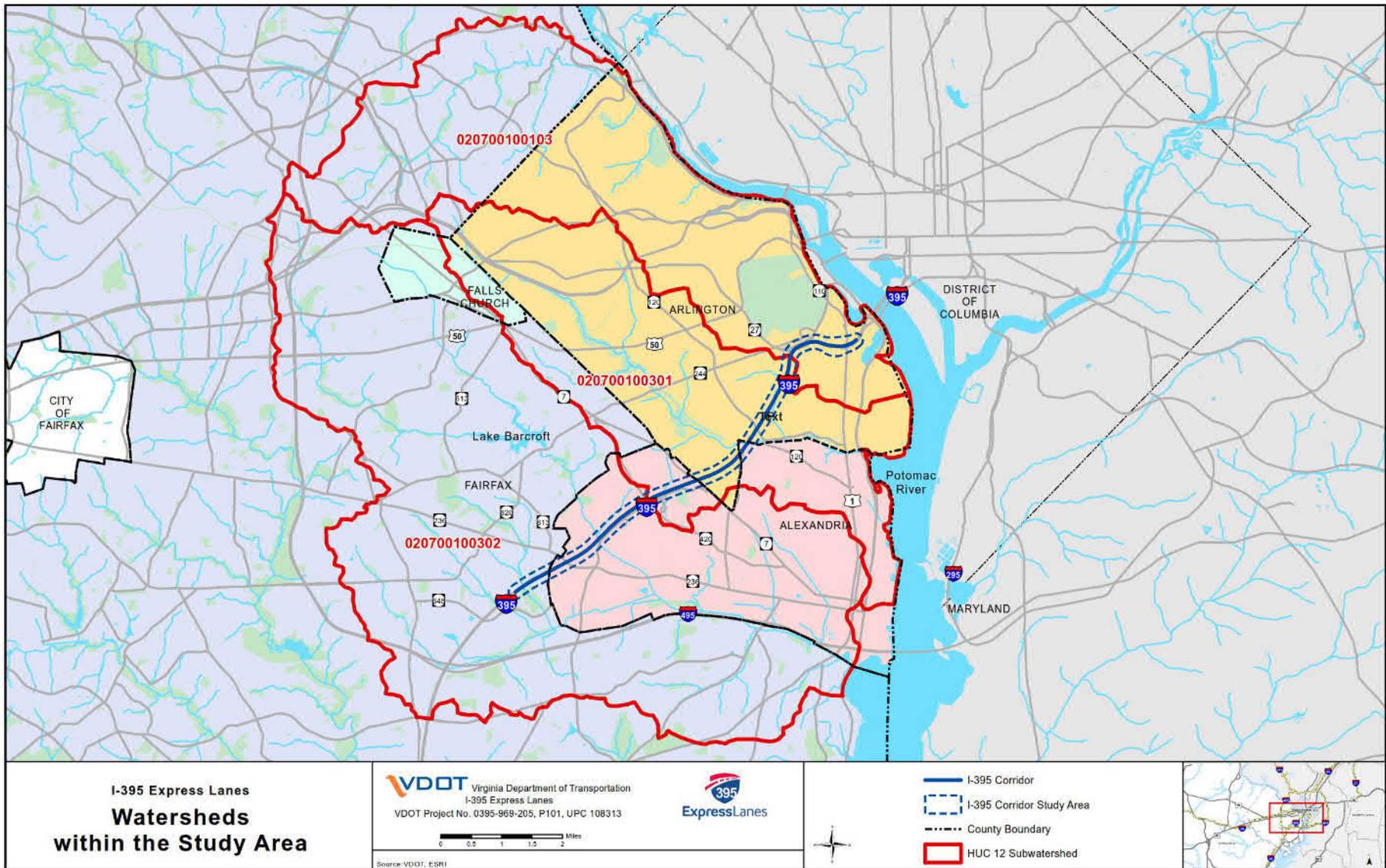
### Build Alternative

The Build Alternative extends eight miles along I-395 beginning at Turkeycock Run, just north of Edsall Road Interchange, to the vicinity of Eads Street Interchange and converts the two existing reversible HOV lanes to three HOT lanes within the median area between the northbound and southbound I-395 general purpose lanes. Modifications are proposed to the Eads Street Interchange to address existing capacity deficiencies and improve transit access to the Pentagon Transit Center and Pentagon Reservation. All other access points to the proposed HOT lanes along the study corridor would remain in their current configuration, but would be converted to HOT access with the exception of the south facing Seminary Road ramp. The south facing Seminary Road ramp will remain a HOV ramp at all times.

## 2. WATERS OF THE U.S.

The study area is located within one subbasin, two watersheds, and three subwatersheds as shown on **Figure 2-1** and summarized in **Table 2-1**. Four named perennial streams pass beneath I-395 along the project length: Four Mile Run, Turkeycock Run, Holmes Run, and Long Branch.

Figure 2-1: Watersheds within the Study Area



Of these, Four Mile Run and Turkeycock Run are the two longest and most prominent stream courses in the study area. All of the streams within the study area ultimately flow to the Potomac River.

**Table 2-1: Summary of Hydrologic Unit Codes (HUC) for the Study Area**

Subbasin (HUC 8)	Watershed (HUC 10)	Subwatershed (HUC 12)
Middle Potomac-Anacostia-Occoquan (HUC 02070010)	Potomac River-Rock Creek (HUC 0207001001)	Potomac River-Pimmit Run (HUC 020700100103)
	Potomac River-Cameron Run (HUC 0207001003)	Potomac River-Fourmile Run (HUC 020700100301)
		Cameron Run (HUC 020700100302)

The U.S. Army Corps of Engineers (USACE) administers regulatory authority over activities affecting waters of the United States (WOUS) pursuant to Section 404 of the Clean Water Act (CWA) of 1977, as amended. Section 404 of the CWA prohibits the discharge of dredged or fill material into WOUS if there is a practicable avoidance alternative. If there is no practicable avoidance alternative, a permit is required for the discharge of dredge or fill material into WOUS. A jurisdictional determination (JD) of the boundaries of wetlands and WOUS is required from USACE to support the permit application. Subsequently, the type and quantity of impacts to jurisdictional surface waters is documented in the permit application.

VDOT performed a wetland delineation to identify the location and extent of jurisdictional features within the study area of the HOV/Bus/HOT Lanes Project between October 2006 and May 2007. The USACE issued a single JD on May 28, 2008. VDOT field verified the wetland delineation within the I-395 study area on April 28, 2016, finding no significant changes from the previous delineation. The USACE approved the reconfirmation of the 2008 JD on July 6, 2016.

Because all work, with the exception of noise barriers, would take place within the existing right of way of I-395, there would be limited direct impacts to water resources. The installation of a noise barrier on the east side of I-395, just north of Route 7, is anticipated to impact approximately 0.004 acres of wetland. **Figure 2-2** shows the delineated wetlands within the study area and **Figure 2-3** shows the location that would potentially be impacted by the noise barrier. Depending on the final design location of noise barriers, additional delineation may be necessary outside of the study area that was reconfirmed on July 6, 2016.

As the design is refined, impacts to wetlands and streams would be avoided to the maximum extent practicable. The use of retaining walls and side slopes may be considered to avoid impacts from lateral encroachment. Placement of noise barriers would be refined as much as practicable to lessen impacts to streams and wetlands while still meeting the noise attenuation goals. Compensation for any unavoidable impacts to streams and wetlands would be provided through the purchase of mitigation banking credits per the approval of permitting agencies.

Figure 2-2: Delineated Wetlands within the Study Area

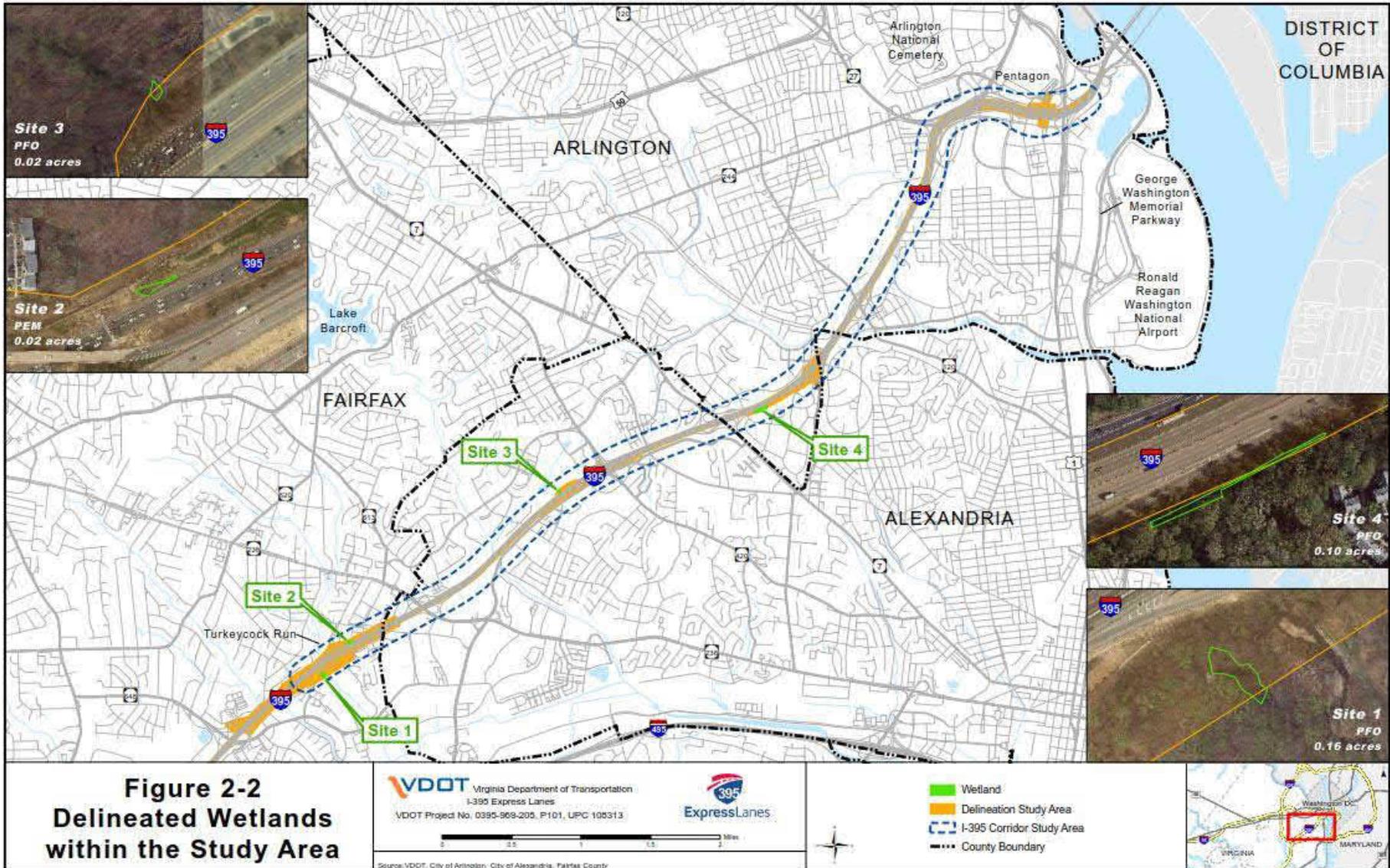


Figure 2-3: Wetland Impacts



### 3. NAVIGABLE WATERS

Under USACE regulations (33 CFR §329) as applied to the study area, navigable waters are determined by the USACE District Engineer and are made conclusive by federal courts. Navigable water determinations are made for all waters that are “presently used or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.” The USACE general definition of navigable waters of the United States is “those waters subject to the ebb and flow of the tide shoreward to the mean high water mark and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. A determination of navigability, once made, applies laterally over the entire surface of the waterbody, and is not extinguished by later actions or events which impede or destroy navigable capacity.” This definition includes all tidal waterbodies including streams/ivers and wetlands. None of the streams within the study area are considered navigable (USACE, 2010).

### 4. CHESAPEAKE BAY PRESERVATION ACT

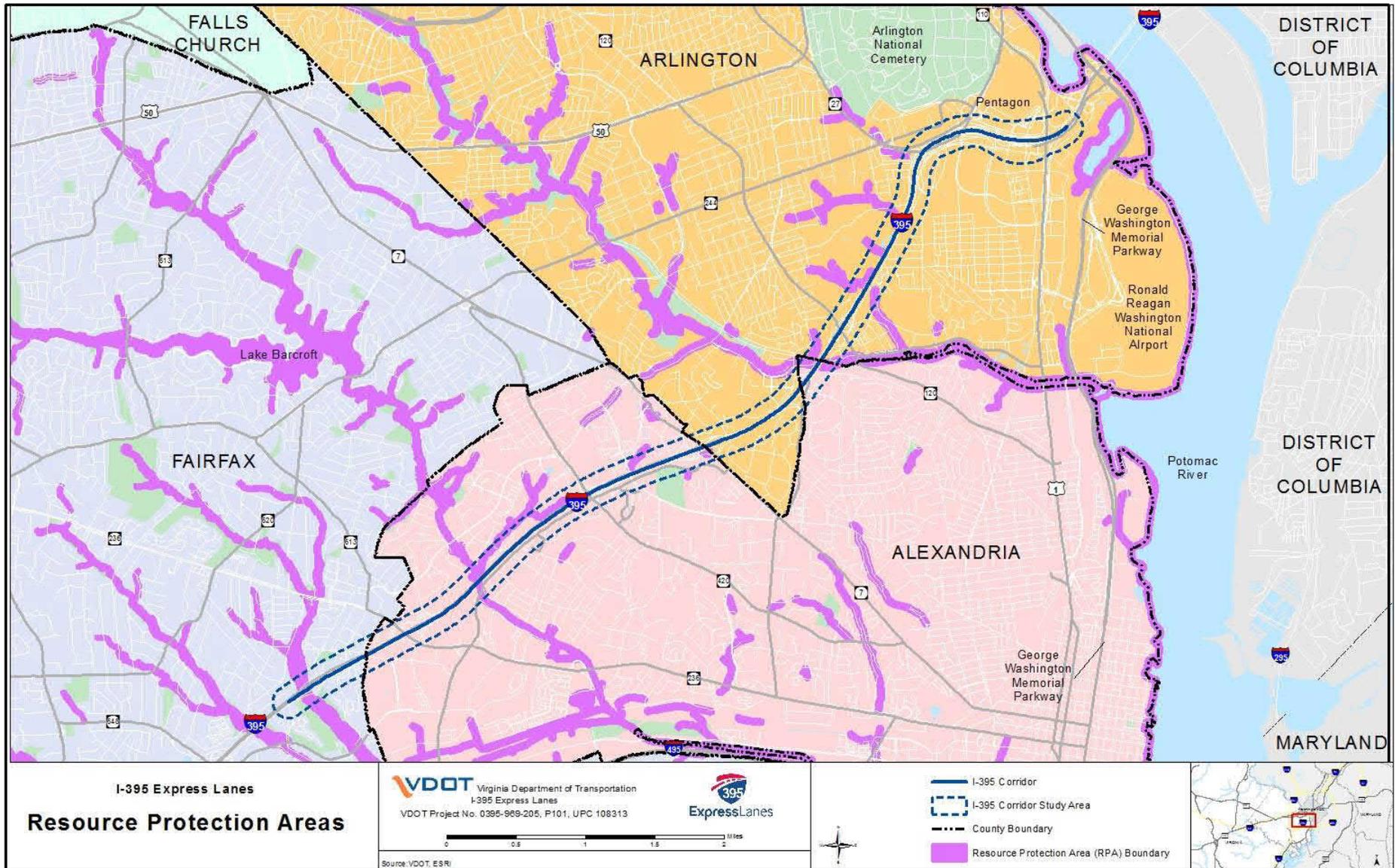
The Chesapeake Bay Preservation Act (Bay Act), administered by Virginia Department of Environmental Quality (VDEQ), regulates development in the Chesapeake Bay watershed. The Chesapeake Bay Preservation Areas consist of Resource Protection Areas (RPAs) and Resource Management Areas (RMAs). RPAs consist of environmentally sensitive lands along shorelines or perennial streams that serve as “filters” by removing pollutants from runoff before these pollutants enter the Chesapeake Bay and tributaries of the Chesapeake Bay. RMAs are contiguous to the entire inland boundary of the RPA, and if improperly used or developed, have the potential for causing water quality degradation or diminishing the functional value of the RPA. Regulations limit development activities from encroaching into the RPAs due to the important functions these areas perform in water quality protection. A total of 77 acres, or approximately 7 percent of the study area, are located within RPAs. **Figure 2-4** displays the locations of the RPAs; complete mapping is not available for the RMAs.

Title 9 of the VAC (9VAC10-20-150B) allows public roads to be located within RPAs subject to certain conditions. Construction, installation, operation, and maintenance of public roads and the roads’ appurtenant structures are exempt if:

- The roadway is constructed in accordance with an erosion and sediment control plan consistent with regulations promulgated pursuant to the Erosion and Sediment Control Law (§10.1-560 et seq. of the Code of Virginia).
- The roadway is constructed in compliance with the Stormwater Management Act (§10.1-603.1 et seq. of the Code of Virginia) and a stormwater management plan is approved by VDEQ.
- The road is designed and constructed to prevent or minimize otherwise minimal encroachment in the RPA and minimize water quality impacts.

Title 9 of the VAC (9VAC25-870-48) allows projects to be grandfathered for stormwater subject to certain conditions. Locality, state, and federal projects shall be considered grandfathered by the Virginia Stormwater Management Program (VSMP) authority and shall be subject to the Part II C technical criteria of 9VAC25-870-93 provided:

Figure 2-4: Resource Protection Areas within the Study Area



1. There has been an obligation of locality, state, or federal funding, in whole or in part, prior to July 1, 2012, or the department has approved a stormwater management plan prior to July 1, 2012;
2. A state permit has not been issued prior to July 1, 2014; and,
3. Land disturbance did not commence prior to July 1, 2014.

This project was approved by VDEQ for grandfathering under the Part II C technical criteria because funds, in part, were obligated prior to July 1, 2012, no state permit was issued prior to July 1, 2014, and land disturbance did not commence prior to July 1, 2014. Additionally, VDOT verified the Universal Project Code (UPC) 70849 existed prior to July 1, 2012. Although this project is grandfathered for stormwater, the project would be compliant with the Bay Act because the project would be designed and constructed in accordance with VDOT's annual erosion and sediment control and stormwater management standards and specifications. VDOT's annual standards and specifications are approved by VDEQ.

## 5. EROSION AND SEDIMENT CONTROL

Erosion and sediment control are regulated by the Virginia Erosion and Sediment Control Act. This Act is primarily administered by localities, which issue land disturbance permits for construction activities. VDEQ manages stormwater in accordance with the VSMP.

Virginia is an authorized state under the federal National Pollutant Discharge Elimination System (NPDES) stormwater permitting programs. VDEQ administers this through the Virginia Pollutant Discharge Elimination System (VPDES) permitting program. Land-disturbing activities greater than 2,500 square feet must comply with the most current version of the VDOT erosion and sediment control annual specifications and the most current version of the Virginia Erosion & Sediment Control Handbook, and must have a project specific erosion and sediment control plan. All regulated land-disturbing activities associated with the project, including on and off site access roads, staging areas, borrow areas, stockpiles, and soil intentionally transported from the project would be covered by the project specific erosion and sediment control plan.

## 6. WATER QUALITY

As directed by Section 305(b) of the CWA, VDEQ monitors water quality in the state's waters, identifying impairments and sources of impairments, and developing and implementing Total Maximum Daily Load (TMDL) reports for those impaired waters (VDEQ 2016). TMDLs are the allowable loadings or loading strategies for waterbodies classified as water quality limited. A TMDL Report is a special study to determine the amount of a pollutant that the impaired water can assimilate and still meet water quality standards.

When surface waters fail to meet water quality standards sufficient to support designated use categories, the waters are classified as "impaired waters" under Section 303(d) of the CWA. Freshwater rivers and surface waters in Virginia are evaluated every two years on the water's ability to support six designated use categories: Recreation, Aquatic Life, Fish Consumption, Shellfish Harvest, Public Water Supply, and Wildlife.

Of the four named perennial streams within the study area, three are classified as impaired: Holmes Run is impaired due to *E. coli* and has an impaired benthic-macroinvertebrate community, and Long Branch and the non-tidal portion of Four-mile Run are impaired due to *E. coli* (VDEQ, 2016). The fourth named perennial stream, Turkeycock Run, is designated as fully supporting one or more designated uses.

Temporary impacts to water quality may occur during roadway construction activities through increased sedimentation from land disturbing activities and occurrences of fuel spills or hydraulic spills from construction equipment. During construction, the contractor would adhere to standard erosion and sediment control and stormwater measures and the associated required monitoring protocols, as prescribed in regulations preceding July 2014.

Generally, VDOT's practice is to maintain both water quality and quantity post-development equal to or better than pre-development, as described in the current guidance, Minimum Requirements for the Engineering, Plan Preparation and Implementation of Post Development Stormwater Management Plans (Instructional and Informational Report Number: IIM-LD-195.8, VDOT – Location and Design Division).

Under the Build Alternative, stormwater management would be provided entirely through the purchase of nutrient credits. The total phosphorous removal requirement per VDOT Method IIC Performance Based calculations is less than ten pounds per year and therefore the project would be eligible to purchase the entire amount of nutrient credits in lieu of constructing best management practice (BMP) stormwater management (SWM) facilities.

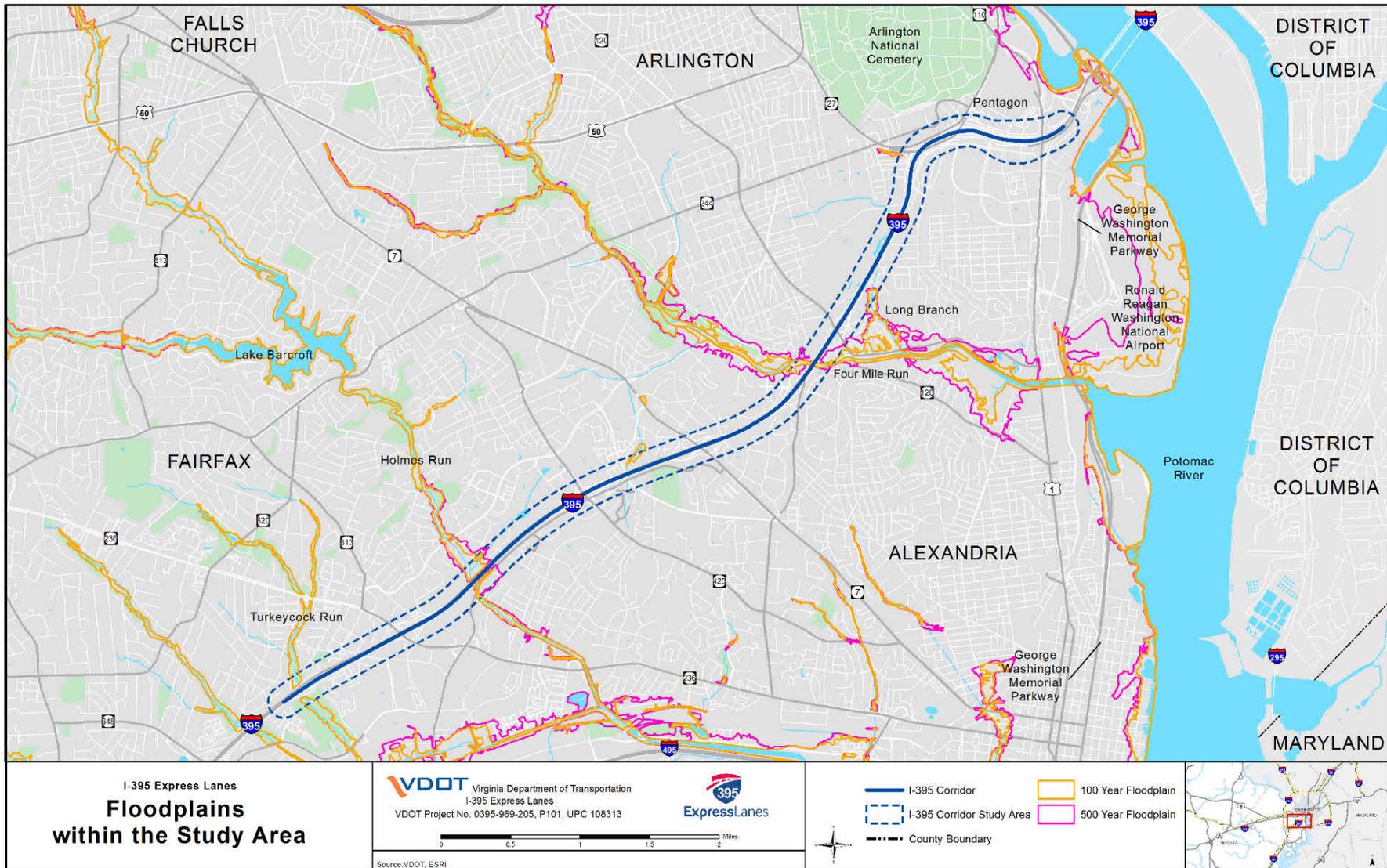
## **7. FLOODPLAINS**

Floodplains provide natural means of detaining floodwaters and thus protect downstream properties from damage. Development in floodplains reduces flood storage capacity and places development in the floodplain and downstream properties at risk. Federal policies, Executive Order (EO) 11988, as amended, EO 13690, and FHWA policy as set forth in 23 CFR §650, require avoidance of effects associated with the modification of and development in floodplains if a practicable alternative (such as shifting alignments to reduce or avoid the floodplains) exists to the proposed action. Federal Emergency Management Agency (FEMA) standards also limit increases in base flood levels to less than 1.0 foot above pre-development levels, provided that hazardous velocities are not produced.

The 100-year flood, or base flood, is the area covered by a flood that has a one percent chance of occurring in any given year; this is commonly referred to as the 100-year floodplain. The 100-year floodplain includes the floodway, which is the area that experiences the deepest water and the highest velocities. The floodplain also includes the flood fringe, which is located just outside the floodway. Floodplains within the study area are depicted on **Figure 7-1**. Locations of designated floodplains and floodways were determined using Flood Boundary and Floodway Maps published by FEMA.

The FEMA regulated floodplains within the study area occur along Four Mile Run, Turkeycock Run, and Holmes Run. These floodplains historically experienced a relatively high level of development encroachment, but are now generally well protected by federal, state, and local regulations.

Figure 7-1: Floodplains within the Study Area



While the roadway would not encroach into floodplains or floodways, noise barriers have the potential to impact 0.09 acres of 100-year floodplains and 0.01 acres of 500-year floodplains. As the design of the noise barriers advances to more detailed design, continued focus would be on avoiding and minimizing floodplain encroachment to ensure that the Build Alternative meets the goals of EO 11998, as amended, EO 13690, and FHWA policy as set forth in 23 CFR §650. During final design, a hydrologic and hydraulic analysis would be required by VDOT to evaluate the effect of the proposed roadway improvements on stormwater discharge. The results of the study would be used to provide adequate design of the hydraulic opening and proper conveyance of floodwaters to minimize potential impacts to the floodplain.

## 8. THREATENED, ENDANGERED, AND SPECIAL STATUS SPECIES

The U.S. Fish and Wildlife Service (USFWS) and National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) regulate and protect federally listed threatened, endangered, and special status species under the Endangered Species Act (ESA) of 1973 with the primary goal of conserving and recovering listed species. The ESA, with few exceptions, prohibits activities affecting threatened, endangered, and special status species unless authorized by a permit. The legal federal status of a species is determined by USFWS and NMFS.

In addition to federal oversight, threatened, endangered, and special status species are also regulated at the state level by a number of different agencies and organizations. The State agencies have adopted the federal list as well as a state list of endangered and threatened species, with the primary focus of managing Virginia's wildlife to maintain optimum populations of all species and conserve biodiversity.

The Virginia Department of Game and Inland Fisheries (VDGIF) is responsible for game, fish and wildlife resources and habitats, and state-listed threatened, endangered, and special status animal species (exclusive of insects). The Virginia Department of Agriculture and Consumer Services (VDACS) is responsible for endangered and threatened species of plants and insects. Virginia Department of Conservation and Recreation (VDCR)'s Division of Natural Heritage (VDCR-DNH) maintains a statewide database for conservation planning and project review.

To identify any documented threatened, endangered, and special status species within the study area, VDOT queried threatened, endangered, and special status species databases including USFWS's Information for Planning and Conservation (IPaC) database, the VDGIF Virginia Fish and Wildlife Information Service (VAFWIS), the VDGIF Wildlife Environmental Review Map Service (WERMS), and the VDCR-DNH database. VDOT also sent scoping letters to VDGIF, USFWS, VDCR-DNH, and VDACS and conducted a pedestrian reconnaissance of the study area to identify the presence of habitat that may be suitable for threatened or endangered species.

The northern long-eared bat and the dwarf wedgemussel, listed as federally threatened and federally endangered, respectively, were identified by the USFWS IPaC to be within the vicinity of the project study area (refer to **Table 8-1**). During fieldwork, VDOT observed trees within the study area that could serve as summer maternity roost trees for northern long-eared bat. Additionally, VDOT received a scoping response letter from VDCR, dated February 23, 2016, which noted the possible presence of the dwarf wedgemussel (*Alasmodonta heterodon*) in Holmes Run, a stream that runs under the existing I-395 corridor. Through site investigation, suitable habitat for the dwarf wedge mussel was confirmed in Holmes Run in the project area.

**Table 8-1: Listed Species Identified as Potentially Occurring Within the Study Area**

Common Name	Scientific Name	Status
Dwarf Wedgemussel	<i>Alasmidonta heterodon</i>	FE, SE
Northern Long-Eared Bat	<i>Myotis septentrionalis</i>	FT, ST

Source: USFWS IPaC, VDGIF-FWIS, and VDCR-DNH

FE = federally endangered, FT= federally threatened, SE = state endangered, ST = state threatened

VDGIF identified that Anadromous Fish Use areas are within two miles of the study area; however, no Anadromous Fish Use areas are currently mapped within the study area (refer to **Figure 8-1**). Although no impacts to Anadromous Fish Use areas are currently proposed, because Anadromous Fish Use areas are mapped downstream of the study area, any impacts to streams may be subject to time-of-year-restrictions, and, therefore, may require additional resource agency coordination.

The VAFWIS database indicated that no other potential or confirmed state-listed species are located within two miles of the study area. Therefore, no further coordination for state-listed species is required.

Following is a description of each of the identified federal threatened, endangered, and special status species potentially located within the study area.

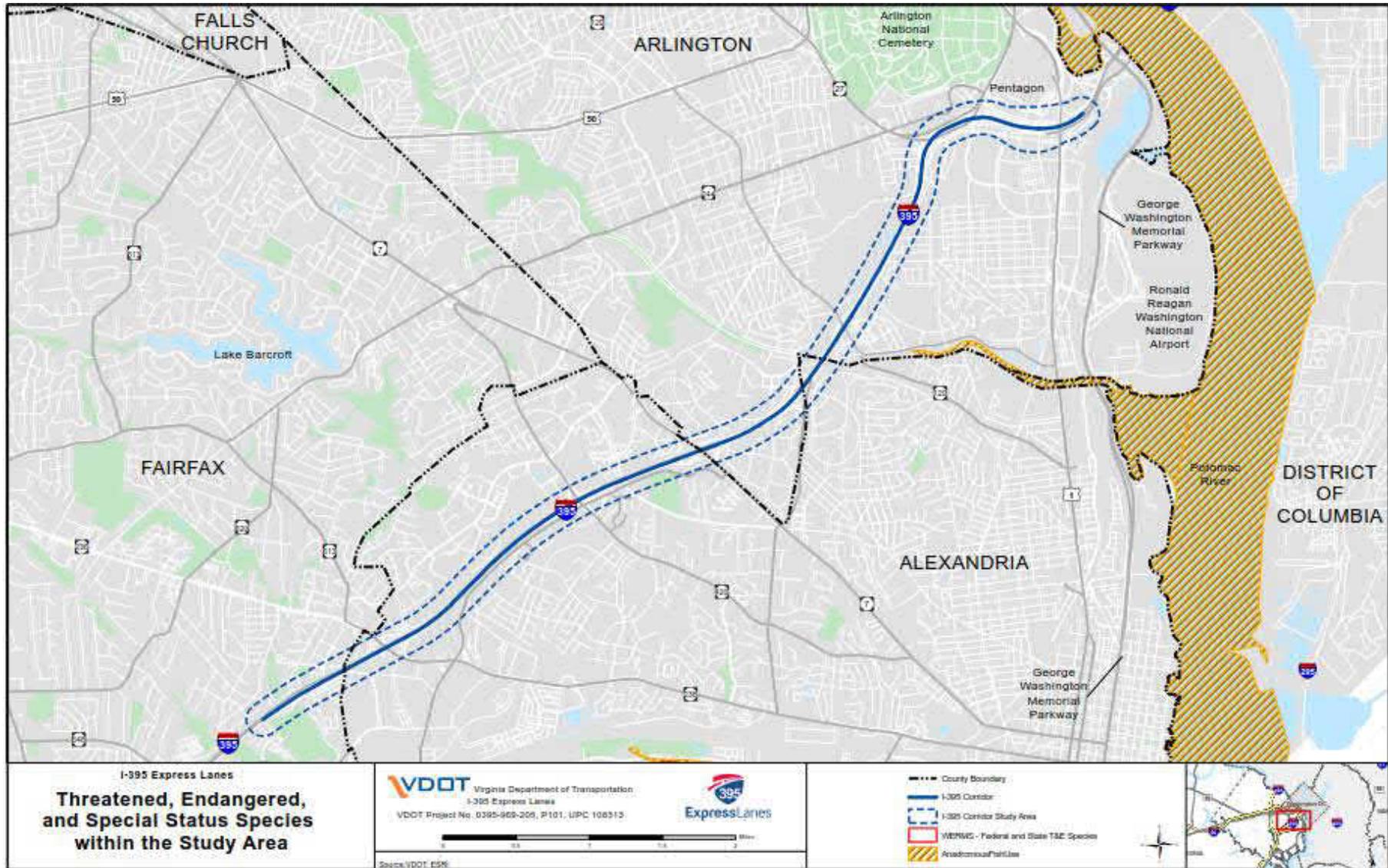
### **Dwarf Wedgemussel**

Dwarf wedgemussel was listed as federally endangered for protection under the Endangered Species Act on March 14, 1990 (USFWS 1990) and is listed as state endangered by the Commonwealth of Virginia. Dwarf wedgemussel is a small freshwater mussel that rarely exceeds 1.5 inches in length and is the only Atlantic Coast freshwater mussel in North America that has two lateral teeth on the right valve, but only one on the left. The outer shell is dark-yellow brown and the inner shell is bluish to silvery white.

Dwarf wedgemussel is usually found in sand, firm muddy sand, and gravel bottoms in rivers of varying sizes with slow to moderate current with silt-free, stable stream beds and well-oxygenated water free of pollutants (USFWS 1990). The mussels tend to burrow in the substrate in shallow riffle and shoal areas (Ahlstedt 1983). Flowing waters are needed to maintain healthy numbers of host fish; however, dwarf wedgemussel can survive in still pools during low flow periods (Michaelson 1993).

Dwarf wedgemussel was believed to have been extirpated from Virginia by 1989, but was rediscovered in Aquia Creek and in the upper Nottoway River in 1990, over 30 miles away from the project area (Terwilliger 1991). Historically in Virginia, dwarf wedgemussel occurred in Mountain Run, Marsh Run near Remington, Blue River, and Maury River (North River) at Lexington; however, reproducing populations are currently only known in Aquia Creek with remnant populations in the South Anna and Nottoway Rivers (VDGIF 2016). All extant populations are small and probably declining due to continued environmental degradation.

Figure 8-1: Threatened, Endangered, and Special Status Species and Resources within the Vicinity of the Study Area



The dwarf wedgemussel has not been documented in any of the localities crossed by the project. The species is being considered because of threatened, endangered, and special status species database query results and resource agency coordination. In addition, a field review concluded that suitable habitat may be present within the project study area. The Build Alternative would not impact any streams; therefore, no impact would occur to the dwarf wedgemussel.

### **Northern Long-Eared Bat**

This bat is widely but patchily distributed in the eastern and northcentral United States and adjacent southern Canada, and southward to southern Texas, Louisiana, Alabama, Georgia, and Florida, and westward in the United States generally to the eastern margin of the Great Plains region. (Barbour and Davis 1969, Harvey 1992, van Zyll de Jong 1985, Hall 1981, Crnkovic 2003, Wilson and Reeder 2005, Amelon and Burhans 2006, Marks and Marks 2006, Henderson *et al.* 2009, Ammerman *et al.* 2012, Park and Broders 2012). The overall summer and winter ranges are essentially the same. The northern long-eared bat has been recorded in all three localities within the study area.

The northern long-eared bat is generally associated with old-growth forests composed of trees 100 years old or older. The species relies on intact interior forest habitat, with low edge-to-interior ratios. Relevant late-successional forest features include a high percentage of old trees, uneven forest structure (resulting in multilayered vertical structure), single and multiple tree-fall gaps, standing snags, and woody debris. These late successional forest characteristics may be favored for several reasons, including the large number of partially dead or decaying trees that the species uses for breeding, summer day roosting, and foraging (USFWS 2011). Small, highly fragmented, or young forests that provide limited areas of subcanopy foraging habitat may not be suitable. Young forests may also lack appropriate nursery sites. (Caceres and Barclay 2000, Henderson *et al.* 2008, Johnson *et al.* 2008). Foraging occurs within forests, along forest edges, over forest clearings, and occasionally over ponds (Ammerman *et al.* 2012). Hibernation occurs primarily in caves, mines, and tunnels, typically those with large passages and entrances, relatively constant and cool temperatures, high humidity, and no air currents (Griffin 1940, Jackson 1961, Mumford and Cope 1964, Kurta 1982, Raesly and Gates 1987, Caceres and Pybus 1997, USFWS 2013). Hibernators frequently roost in crevices, drill holes, and similar sites (Griffin 1940, Layne 1958, Pearson 1962, Caire *et al.* 1979, Whitaker and Mumford 2009) where the bats may be overlooked during surveys, but roosting in the open is not uncommon (Barbour and Davis 1969, Whitaker and Mumford 2009). Rarely are there more than 100 individuals per hibernation colony (Barbour and Davis 1969, Caire *et al.* 1979). Individuals usually roost solitarily (NatureServe 2016). In summer, these bats generally are colonial, but reproductive females and juveniles often roost alone (Foster and Kurta 1999).

This species has experienced severe recent declines associated with rapidly spreading white-nose syndrome in eastern North America, threats from wind-energy development, winter and summer habitat modification, destruction and disturbance of habitat (e.g., vandalism to hibernacula, roost tree removal), climate change, and environmental contaminants.

On February 16, 2016, the USFWS promulgated the final 4(d) rule, which significantly changed USFWS' recommended conservation measures. The final 4(d) rule states:

*Under this final 4(d) rule, incidental take within the WNS [white nose syndrome] zone involving tree removal is not prohibited if two conservation measures are followed. The first measure is the*

*application of a 0.25-mile (0.4 km) buffer around known occupied northern long-eared bat hibernacula. The second conservation measure is that the activity does not cut or destroy known occupied maternity roost trees, or any other trees within a 150-foot (45-m) radius around the maternity roost tree, during the pup season (June 1 through July 31).*

According to occurrence data managed by VDGIF and available online through the Northern Long-Eared Bat Winter Habitat and Roost Tree Application, no known or documented hibernacula or maternity roosts occur within the study area; therefore, the project may affect, but is not likely to adversely affect the northern long-eared bat.

Further coordination with agencies and final affect determinations for listed species would be conducted as a part of the 401/404 permit process.

## 9. INVASIVE SPECIES

Invasive species are nonnative plant, animal, or microbial species that cause, or are likely to cause, economic or ecological harm or harm to human health (EO 13112). “Nonnative” (or “alien,” “nuisance,” “exotic,” or “nonindigenous”) means that the species has been introduced by human action, intentionally or accidentally, into a region outside of the species’ natural geographic range. Introductions can occur through a variety of pathways, including intentional transport of a species for commercial purposes, accidental introduction such as invasive plant species seeds in fill material, or intentional releases such as illegal stocking of fish or for biological control of a pest (EPA, 2012a).

EO 13112 (Invasive Species) requires federal agencies to prevent the introduction of plants and animals that are not indigenous to the United States, provide for the control of these species, and minimize the economic, ecological, and human health impacts that invasive species cause. The duties detailed in EO 13112 are executed by federal agencies and the Invasive Species Council, which identify, monitor, control, and restore habitats adversely affected by invasive species. Compliance with the order restricts federal agencies from using allocated funds for construction, rehabilitation, re-vegetation, enhancement or landscaping that includes use of nuisance, and invasive plants and animals.

Transportation corridors, such as roads and highways, allow opportunities and can serve as conduits for the dispersal of invasive species (particularly plant species). Where transportation corridors cross waterways, the dispersal of invasive species can quickly expand to other areas. Invasive species can move on vehicles and in the loads that the vehicles transport. Invasive plants can be moved from site to site during roadside maintenance operations. Weed seed can inadvertently be introduced by equipment into a corridor during construction on equipment and through the use of mulch, imported soil, water, or gravel and sod. Some invasive plant species may be deliberately planted as part of erosion control, landscape, and wildflower projects (NCHRP, 2006).

Invasive species cause harm to native species, natural communities, and ecosystem processes and are a major factor in freshwater fish extinctions and endangerments. Over 45 percent of current and candidate ESA-listed species are considered to be at risk, at least partly, due to invasive species (USFWS, 2012b). Invasive species can also cause great economic harm, costing Virginia over \$1 billion and the United States more than \$120 billion in damages every year (Pimentel et al., 2005). These costs not only include remedial efforts, but also the economic impact of invasive species on agriculture and aquaculture industries.

The study area is an intensely developed area with the majority of plant communities containing multiple invasive species. Common invasive species within the study area identified during field review include the following:

- tree of heaven (*Ailanthus altissima*)
- Bradford pear (*Pyrus calleryana*)
- multiflora rose (*Rosa multiflora*)
- Amur honeysuckle (*Lonicera maackii*)
- porcelain berry (*Ampelopsis brevipedunculata*)
- common privet (*Ligustrum vulgaris*)
- English ivy (*Hedera helix*)
- periwinkle (*Vinca minor*)
- winter creeper (*Euonymus fortunei*)
- Japanese knotweed (*Polygonum cuspidatum*)
- Japanese stiltgrass (*Microstegium vimineum*)
- Asiatic tearthumb (*Polygonum perfoliatum*).

The invasive plant species are most dominant in the disturbed areas with adequate or full sun exposure.

There is potential for invasive species to become established along the limits of disturbance of the project during and following construction. Construction of the project has the potential to spread invasive species via the entering and exiting of contaminated construction equipment, the inclusion of invasive species in seed mixtures and mulch, and the improper removal and disposal of invasive species so that seed is spread along the highway.

Because the study area is highly disturbed and already dominated by invasive species, any net increase in invasive species that would result from construction of the project would be negligible. In addition, VDOT’s Road and Bridge Specifications manual (VDOT, 2016), which is a required guideline for highway construction projects in Virginia, includes provisions intended to control noxious weeds (which includes non-native and invasive species). Specifically, Section 244.02(c), entitled “Roadside Development Materials – Seeds” states:

*Noxious weed seeds, as defined by the rules and regulations adopted for enforcement of the Virginia Seed Law will not be permitted except as stated herein. The number of restricted noxious weed seeds shall be not more than the number per ounce or per pound of noxious weed seeds specified in the rules and regulations of the Virginia Seed Law.*

The Virginia Seed Law, Article 1 (§3.2-4000 *et seq.*) of Chapter 40 of Title 3.2 of the Code of Virginia in combination with the Virginia Administrative Code (2VAC-5-390-20. Noxious Weed Seeds), provides a list of noxious weed seeds that are prohibited or restricted in Virginia. The list of noxious weed seeds includes species that are considered to be invasive by VDCR-DNH (Heffernan et al., 2014).

Section 244.02(g)1 of the VDOT Road and Bridge Specifications manual, entitled “Roadside Development Materials – Dry Straw or Hay” states:

*...dry straw or hay shall be free from noxious weeds, reasonably bright in color, and not be musty, moldy, caked, decayed, or dusty....*

Finally, Section 244.02(i) of the VDOT Road and Bridge Specifications manual, entitled “Roadside Development Materials – Trees, Shrubs, Vines, and Other Plants” states:

*Plant material which shows evidence of containing any parts (seeds, rhizomes, roots) of Johnson Grass, Bull Thistle, or Canada Thistle will be rejected.*

Johnson grass, bull thistle, and Canada thistle are all included on VDCR-DNH's list of invasive plant species.

While rights-of-ways are at risk from invasive species colonization from adjacent properties, implementing these provisions would reduce or minimize potential for introduction, proliferation, and spread of invasive species. In addition, the implementation of BMPs for erosion/sediment control and abatement of pollutant loading would minimize secondary impacts to adjoining communities and habitat by reducing excess nutrient loads that could encourage invasive species proliferation.

## 10. WILDLIFE HABITAT

The ability of an area to support a diverse assemblage of wildlife species can be influenced by the disturbance regime of the habitat, the relative size of the habitat, and the suitability of the habitat to serve as a corridor providing connectivity to other suitable habitat.

The wildlife in the study area primarily consists of species that are adapted to urban environments; however, some of the major riparian corridors contain forested habitat that supports fauna more typically found in less disturbed floodplain forests, including neotropical migrant birds. These riparian corridors with native vegetation can serve as wildlife corridors, linking wildlife habitats that might otherwise be separated by human development (NWF, 2016).

The study area includes three urban wildlife corridors associated with the riparian habitat along Turkeycock Run, Holmes Run, and Four Mile Run. These corridors are intersected by numerous secondary roads, which fragment the corridor, but do not prevent the continued use of the corridors. Urban wildlife species using these wildlife corridors currently can pass beneath I-395 through the existing culverts or bridges. None of these wildlife corridors would be modified by the project. In addition, the project would not add impediments to their utilization by wildlife. Noise barriers may be placed adjacent to the road and wildlife corridors, but would not impede wildlife movement any more than the existing highway and culverts.

## 11. PERMITS

Based on the anticipated impacts of the project, the project may require a Section 404 permit from the USACE, a Virginia Water Protection Individual Permit from VDEQ (which serves as the Section 401 certification), and a subaqueous bottomland permit from Virginia Marine Resources Commission (VMRC) for impacts to systems with drainage areas greater than five square miles.

The federal and state permit programs rely on the use of compensatory mitigation to offset unavoidable aquatic impacts by replacing lost functions with replicated functions elsewhere. Appropriate mitigation is coordinated by the agencies. Compensatory mitigation would be required for permanent impacts to streams and wetlands resulting from the project. Compensatory mitigation is typically required in the same or adjacent hydrologic unit code (HUC) within the same watershed and physiographic province as the impact.

Regulations providing guidance for compensatory mitigation were jointly issued by USACE and EPA and became effective 2008. These regulations, referred to as the Mitigation Rule, established a national

framework and hierarchy of preferences regarding how compensatory mitigation is addressed for project impacts to jurisdictional surface waters. The Mitigation Rule provides the following preference for compensatory mitigation options:

- Purchase of compensatory mitigation bank credits.
- Purchase of an approved in-lieu fee fund credits.
- Watershed approach based mitigation by the permittee.
- On-site mitigation/in-kind mitigation by the permittee.
- Off-site mitigation/out-of-kind mitigation by the permittee.

The current typical compensatory mitigation impact ratios in Virginia for non-tidal forested, scrub-shrub, and emergent wetlands are 2:1, 1.5:1, and 1:1, respectively.

In accordance with the existing regulations and standard permit conditions, all areas with temporary impacts would be required to be restored to the areas' original contours and re-vegetated with the same or similar species.

In areas pursuant to the Bay Act, the Chesapeake Bay Preservation Area Designation and Management Regulations require the operator or owner of construction activities disturbing land equal to or greater than 2,500 square feet to register for coverage under the VDEQ General Permit for Discharges of Stormwater from Construction Activities and develop a project specific Stormwater Pollution Prevention Plan (SWPPP). The SWPPP must be prepared prior to submission of the registration statement for coverage under the general permit and must address water quality and quantity in accordance with the VSMP Permit Regulations.

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