

ENVIRONMENTAL ASSESSMENT

Natural Resources Technical Report

February 2020



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1.0 INTRODUCTION

The Virginia Department of Transportation (VDOT), in coordination with the Federal Highway Administration (FHWA) as the lead federal agency, is evaluating an extension of the Interstate 495 (I-495) Express Lanes along approximately three miles of I-495, also referred to as the Capital Beltway, from their current northern terminus in the vicinity of the Old Dominion Drive overpass to the George Washington Memorial Parkway (GWMP) in the McLean area of Fairfax County, Virginia. Pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended, and in accordance with FHWA regulations¹, an Environmental Assessment (EA) is being prepared to analyze the potential social, economic, and environmental effects associated with the improvements being evaluated.

The purpose of this Natural Resources Technical Report (NRTR) is to identify existing natural resources within the study area and to evaluate potential impacts that could result from implementation of the Build Alternative. Information in this report provides an overview of the regulatory context, methods used to identify existing resources, potentially affected resources identified within the study area, and potential impacts to natural resources associated with the implementation of the Build Alternative. The findings of this technical report support discussions presented in the EA.

1.1 PROJECT TERMINI

The project includes an extension of the existing Express Lanes from their current northern terminus south of the Old Dominion Drive Overpass to the GWMP. Although the GWMP provides a logical northern terminus for this study, additional improvements are anticipated to extend approximately 0.3 miles north of the GWMP to provide a tie-in to the existing road network in the vicinity of the American Legion Memorial Bridge (ALMB). The project also includes access ramp improvements and lane reconfigurations along portions of the Dulles Toll Road and the Dulles International Airport Access Highway, on either side of the Capital Beltway, from the Spring Hill Road Interchange to the Route 123 interchange. The proposed improvements entail new and reconfigured express lane ramps and general purpose lane ramps at the Dulles Interchange and Route 123/I-495 interchange ramp connections.

1.2 STUDY AREA

In order to assess and document relevant resources that may be affected by the proposed project, the study area for this EA extends beyond the immediate area of the proposed improvements described above. The study area for the EA includes approximately four miles along I-495 between the Route 123 interchange and the ALMB up to the Maryland state line. The study area also extends approximately 2,500 feet east along the GWMP. Intersecting roadways and interchanges are also included in the study area, as well as adjacent areas within 600 feet of the existing edge of pavement. The study area boundary is a buffer around the road corridor that includes all natural, cultural, and physical resources that must be analyzed in the EA. It does not represent the limits of disturbance (LOD) of the project nor imply right-of-way take or construction impact, but rather extends beyond the project footprint to tie into the surrounding network, including tying into future network improvements. **Figure 1-1** depicts the project termini, study area, and LOD.

¹ NEPA and FHWA's regulations for Environmental Impact and Related Procedures can be found at 42 USC § 4332(c), as amended, and 23 CFR § 771, respectively.

1.3 LIMIT OF DISTURBANCE

Potential impacts to natural resources described in the following sections of this technical report have been calculated using a conceptual level design of the Build Alternative. The footprint for this conceptual level of design is referred to as the LOD. The LOD accommodates roadway improvements, drainage, stormwater management facilities, utilities, erosion and sediment control, noise control measures, construction methods, and temporary construction easements.

Impact values presented for the evaluated resources represent the worst-case scenarios and assume complete direct impact to the resource occurring in the LOD. As design progresses, measures may be taken to avoid and minimize impacts to environmental resources to the maximum extent practicable. Recommendations for potential minimization and mitigation measures for unavoidable adverse impacts are provided under the Build Alternative sections of each resource that is discussed in this report. At this time, it is not possible to anticipate the exact locations of each proposed activity; impacts outside of the existing study area will be reviewed and documented through future NEPA re-evaluations.

1.4 PURPOSE AND NEED

The purpose and need for the extension of Express Lanes on I-495 between Route 267 and the GWMP is to:

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

A detailed description of the purpose and need for the proposed project can be found in Chapter 1.0 of the EA.

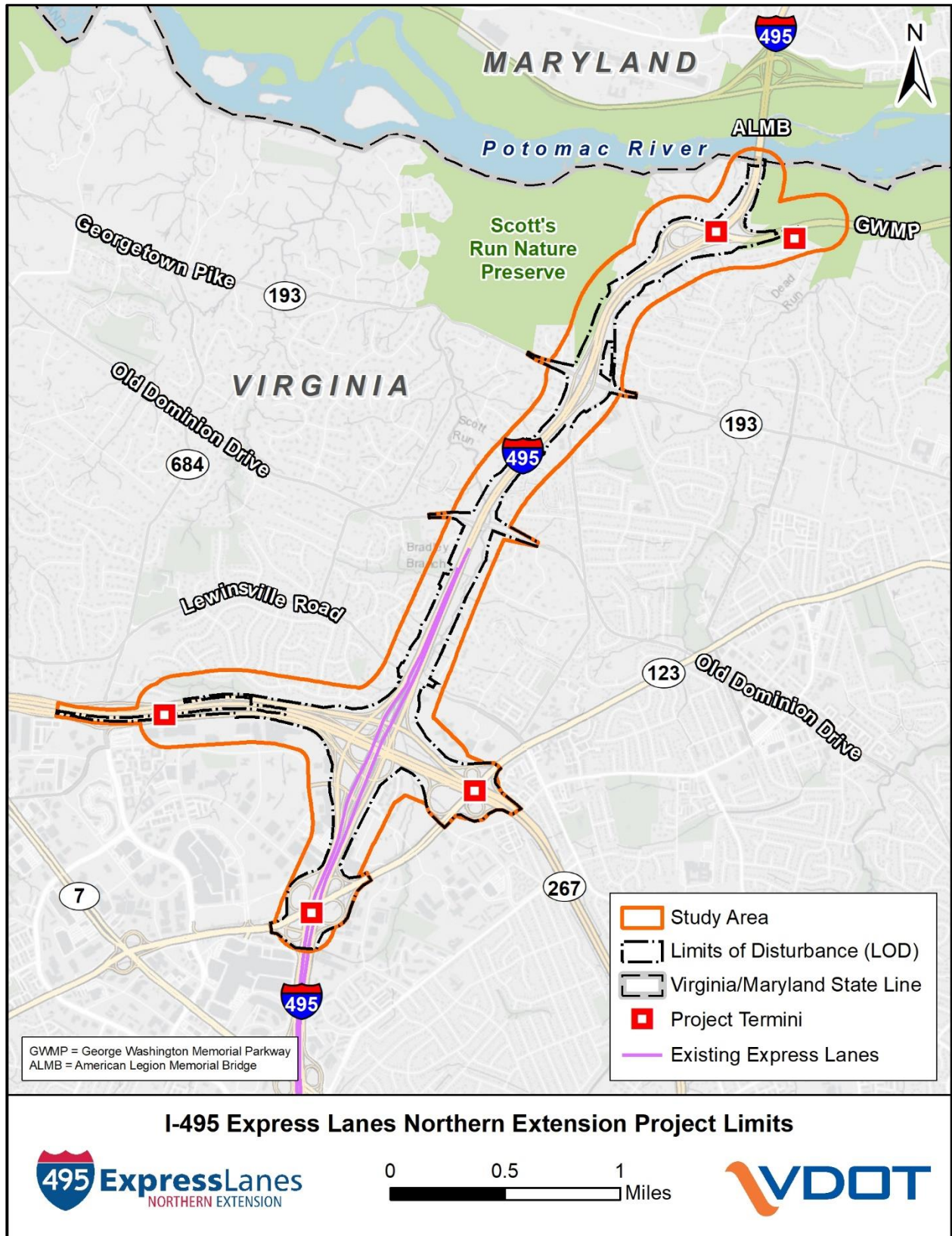


Figure 1-1. I-495 Express Lanes Northern Extension Project Limits

2.0 ALTERNATIVES

Two alternatives are being considered in the EA: the No Build Alternative² and the Build Alternative, described below. Additional information on the Build Alternative is included in the *I-495 Alternatives Technical Report* (VDOT, 2020a).

2.1 NO BUILD ALTERNATIVE

Under the No Build Alternative, the Express Lanes would not be extended beyond the current northern terminus at Old Dominion Drive. There would be no change to existing access points, and I-495 would remain in its present configuration. VDOT would continue maintenance and repairs of the existing roadway, as needed, with no substantial changes to current capacity or management activities.

2.2 BUILD ALTERNATIVE

The Build Alternative would extend the existing four I-495 Express Lanes from their current terminus between the I-495/Route 267 interchange and the Old Dominion Drive Overpass north approximately 2.3 miles to the GWMP.

Additional improvements are anticipated to extend approximately 0.3 miles north of the GWMP to tie into the existing road network in the vicinity of the ALMB. The Build Alternative would retain the existing number of general purpose (GP) lanes within the study area.

Direct access ramps would be provided from the I-495 Express Lanes to the Dulles Toll Road and the GWMP. Access would also be provided between the I-495 GP and Express Lanes at the Route 267 interchange: from northbound GP lanes to northbound Express Lanes, and from southbound Express Lanes to southbound GP lanes, located within the current interchange footprint. These connections have been accounted for in the LOD and are described in more detail in the *I-495 Alternatives Technical Report* (VDOT, 2020a) and the *I-495 Traffic and Transportation Technical Report* (VDOT, 2020b).

The Build Alternative includes an approximately 3.1-mile 10-foot-wide shared-use path, consistent with the Fairfax County Countywide Trails Plan Map (FCDPZ, 2018) that is not provided under the existing condition.

² According to FHWA guidelines, the consideration of a No Build Alternative is a requirement under NEPA. The Build Alternative must be reasonable and practicable enough to dismiss the No Build Alternative (FHWA, 1990).

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

Natural resources in the study area were identified based on agency input through the scoping process, review of existing available scientific literature, Geographic Information System (GIS) databases, and mapping and field reconnaissance of the study area, which occurred in August 2018. Supplemental fieldwork was completed in September 2019 and along the GWMP in May 2019 to gather more data and further verify the information collected in 2018.

Database information was obtained from the following regulatory agencies and groups regarding natural resources in the study area:

- Center for Conservation Biology (CCB) – Developed and supported by the College of William & Mary and Virginia Commonwealth University
- United States Environmental Protection Agency (USEPA)
- Federal Emergency Management Agency (FEMA)
- United States Fish and Wildlife Service (USFWS)
- National Marine Fisheries Service (NMFS)
- National Oceanic and Atmospheric Administration (NOAA)
- Natural Resources Conservation Service (NRCS)
- United States Army Corps of Engineers (USACE)
- United States Department of Agriculture (USDA)
- United States Geological Survey (USGS)
- Virginia Department of Agriculture and Consumer Services (VDACS)
- Virginia Department of Conservation and Recreation (VDCR)
- Virginia Department of Environmental Quality (VDEQ)
- Virginia Department of Game and Inland Fisheries (VDGIF)
- Virginia Department of Health (VDH)
- Virginia Department of Forestry (VDOT)
- Virginia Geographic Information Network (VGIN)
- Virginia Institute of Marine Science (VIMS)
- Virginia Marine Resources Commission (VMRC)

Specific information regarding data gathering sources and approach are presented within the discussion of each resource in the following sections.

3.1 WATER RESOURCES

3.1.1 Water Quality

Regulatory

In compliance with Sections 303(d), 305(b), and 314 of the Federal Water Pollution Control Act (i.e., 1972 Clean Water Act amended in 1977, or CWA) and the Safe Drinking Water Act, VDEQ has developed a prioritized list of water bodies that currently do not meet state water quality standards (VDEQ, 2019h). Water quality standards are set based on the designated use for a given waterbody.

All Virginia waters are designated for one of the following primary uses:

- Recreational uses, such as swimming and boating
- The propagation and growth of a balanced, indigenous population of aquatic life, including game fish, which might reasonably be expected to inhabit them
- Wildlife
- The production of edible and marketable natural resources, such as fish and shellfish (VDEQ, 2019h)

Virginia's water quality standards (9 VAC 25-260) define the water quality needed to support each of these primary uses by establishing numeric physical and chemical criteria. VDEQ monitors streams and water bodies for a variety of water quality parameters, including the following: temperature, dissolved oxygen (DO) levels, pH, the presence of fecal coliform (*Escherichia coli*) and enterococci bacteria, total phosphorus and chlorophyll-a levels, benthic invertebrates, metals and toxins in the water column, sediments, and fish tissues. By monitoring these parameters, VDEQ determines which water bodies have impaired water quality and how the type or extent of impairment affects the primary uses of the water body. If a water body fails to meet the water quality standards for its designated use, it is considered to be impaired and placed on the 303(d) list, as required by Section 303(d) of the CWA (VDEQ, 2019d). The 303(d) list is updated on a biennial basis. State waters can be added to or removed from the 303(d) list with each new list publication.

Once a water body has been identified as impaired due to human activities and placed on the 303(d) list, VDEQ is required to develop a Total Maximum Daily Load (TMDL) for the parameters that do not meet state water quality standards. The TMDL is a reduction plan that defines the limit of a pollutant that a water body can receive and still meet water quality standards. A TMDL implementation plan, including Waste Load Allocations (WLA), is developed by VDEQ once the TMDL is approved by the USEPA. The ultimate goal of the TMDL implementation plan is to restore the impaired water body and maintain its water quality for its designated primary uses.

The Virginia Stormwater Management Program (VSMP) also includes regulations (9 VAC 25-870) requiring water quality treatment, stream channel protection, and flood control standards for all new construction and redevelopment projects (VDEQ, 2019d), in support of water quality standards. This includes the requirement for development of Stormwater Pollution Prevention Plans (SWPPP), erosion and sediment control plan approval by VSMP approving authority, and the requirement for construction activities to obtain a Construction General Permit prior to land disturbing activities.

Methodology

The *Final 2016 305(b)/303(d) Water Quality Assessment Integrated Report* was approved by USEPA on March 6, 2018 and released by VDEQ on April 2, 2018 (VDEQ, 2018c). The report summarizes water quality conditions in Virginia from January 1, 2009 through December 31, 2014. Data from this report is available as GIS shapefiles, and these were used to determine the location of impaired waters in relation to the study area. Conditions for the Potomac River were identified on the Maryland DEQ website (MDE, 2018). Maryland did not have a GIS shapefile available for their impaired waters, so the Potomac River was digitized by hand.

Existing Conditions

Of the 49 streams that were identified in the study area (see **Section 3.1.2** for additional details), Dead Run and the Potomac River are the only designated impaired waters under Section 303(d) of the CWA (see

Figure 3-1). Dead Run (ID# VAN-A11R_DEA01A04) is listed as “impaired” due to an impaired macroinvertebrate community (VDEQ, 2018b). Although the Potomac River (ID# MD-02140202) is technically in Maryland, it is addressed in this report because it falls within the study area. The Potomac River is on Maryland’s impaired waters list due to excess nutrient and sediment inputs (MDE, 2018).

Environmental Consequences

No Build Alternative

Under the No Build Alternative, no project-related construction would occur, and therefore no changes in water quality would result. Areas along the I-495 corridor where stormwater management features are absent or outdated would not be improved under the No Build Alternative.

Build Alternative

Construction impacts under the Build Alternative include dynamic messaging signs³ that would potentially be installed along the north side of the GWMP in the vicinity of Dead Run, which would also require the installation of subsurface electrical and communications conduits. Although none of these impacts would be within the physical footprint of Dead Run, as it is not within the LOD, potential impacts during construction include erosion and/or sedimentation or accidental spills of hazardous materials from construction equipment that could make their way downstream via stormwater. If these contaminants were to enter the waterbody, they have the potential to degrade drinking water quality, wildlife, and the surrounding land (USEPA, 2019). They could also contribute to the TMDL of Dead Run, which if exceeded could further deteriorate resources and lead to increased impairment (USEPA, 2018c). These potential impacts would be avoided by following proper spill prevention and erosion and sediment control (ESC) procedures as contained in 9VAC25-880 (Virginia’s water quality standards) and the VDOT drainage manual (VDOT, 2019a). Although the mainstem Potomac River is on the 303(d) list for the state of Maryland, it is not within the Build Alternative’s LOD and is not expected to be impacted. There are several tributaries of the Potomac River that are within the study area, but besides Dead Run, none of these are on the 303(d) list.

Post-construction impacts, if any, would primarily result from the increase in impervious surface area. Runoff from roadways could contain heavy metals, salt, organic compounds, and nutrients. Modern temporary and permanent stormwater management (SWM) measures, including SWM ponds, sediment basins, vegetative controls, and other measures would be implemented, in accordance with the VSMP and applicable guidance, to minimize potential degradation of water quality due to increased impervious surface and drainage alteration. These measures would reduce or detain discharge volumes and remove many pollutants before discharging into the receiving impaired water.

³ Dynamic messaging signs (DMS) are electronic roadway signs used to provide drivers with updated information regarding weather, construction, detours, hazards, traffic, a change in speed limit, or other useful information.

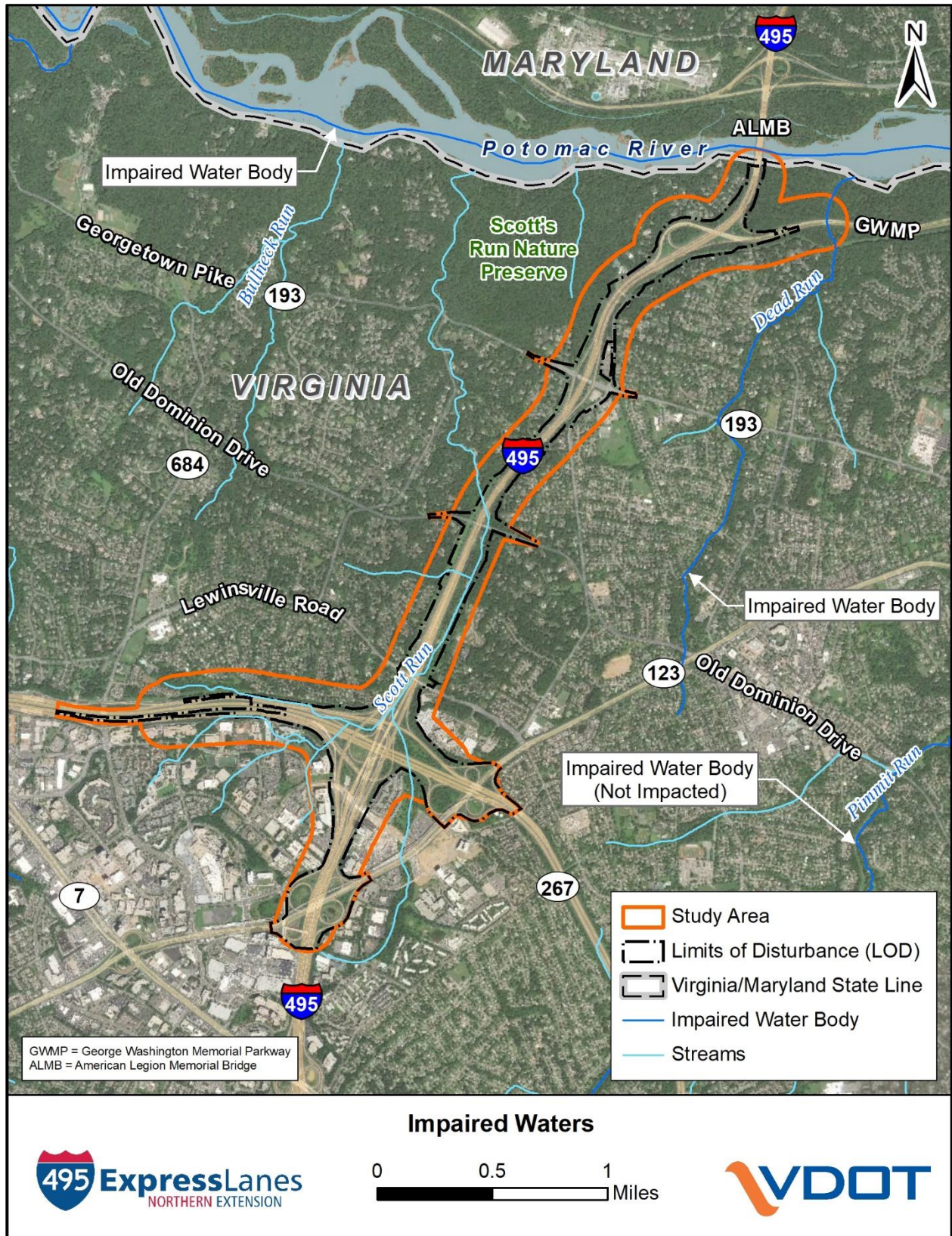


Figure 3-1. Impaired Waters

3.1.2 Streams

Regulatory

Water resources are federally regulated by the USEPA and USACE under the CWA. Section 404 of the CWA specifically regulates dredge and fill activities affecting Waters of the United States (WOUS), which can be defined as all navigable waters and waters that have been used for interstate or foreign commerce, their tributaries and associated wetlands, and any other waters, including lakes, rivers, streams, ponds, impoundments, territorial seas, etc., that, if impacted, could affect the former (USEPA, 2019a). The USEPA and USACE share responsibility for implementing Section 404 of the CWA and issuing permits for discharges into WOUS (VDEQ, 2019j). The USACE also regulates wetlands and waters under Section 10 of the Rivers and Harbors Appropriation Act of 1899, which requires the USACE to authorize any excavation or fill in navigable waters.

Before USACE issues a permit to impact WOUS under Section 404 and/or Section 10, the state must also certify that state water quality standards would not be violated by the proposed work (Section 401 of the CWA). In Virginia, VDEQ is the authority that provides the Section 401 certification through its Virginia Water Protection (VWP) Permit Program (9 VAC 25-210), which gets its statutory authority from the Code of Virginia (VAC 62.1-44.15). State law requires that a VWP permit be obtained before disturbing a stream by clearing, filling, excavating, draining, or ditching (VDEQ, 2019g). The issuance of a state VWP permit does not depend on the issuance of a Federal Section 404 permit.

Work in, above, or under waters seaward of the Ordinary High-Water Mark of non-tidal streams with drainage areas greater than five square miles also require a permit from the VMRC under the authority of the Code of Virginia (VAC 28.2-1204). The U.S. Coast Guard, USACE, VDEQ, and VMRC all issue permits for various activities in, under, and over WOUS. Separate regulations are applicable to tidal waters, which are not relevant to this report.

On January 15, 2020, at the time the jurisdiction was determined for onsite waters via the jurisdictional determination process, the USACE was operating under the “Step One” rule, also known as the Clean Water Act Jurisdiction following the U.S. Supreme Court’s Decision in *Rapanos v. United States & Carabell v. United States* (EPA, 2008).

Methodology

Presence of non-tidal streams within the study area was reviewed via the National Hydrography Dataset (NHD) from the USGS (USGS, 2018). Additionally, streams in the study area were classified during field reconnaissance surveys, which occurred in August 2018, May 2019, and September 2019, using Regulatory Guidance Letter No. 05-05 from USACE and investigated in accordance with federal limits (defined in 33 CFR Part 328).

The boundaries of non-tidal WOUS are set at the ordinary high-water mark (OHWM). The OHWM is determined in the field using physical characteristics established by the fluctuations of water (e.g., change in plant community, changes in the soil character, shelving, etc.). Stream conditions were evaluated using the Unified Stream Methodology (USM) for use in Virginia (USACE, 2007). Streams were assessed using Form 1 of the USM to assign a Reach Condition Index (RCI) to each perennial/intermittent stream reach. Ephemeral streams were assessed using Form 1a of the USM to assign an RCI to stream reach. Parameters used to determine RCI for perennial/intermittent streams include channel condition, riparian buffers, in-stream habitat and available cover, and channel alteration. RCI values range from 0.5 to 1.5, with the highest

value assigned to streams exhibiting optimum channel, habitat, and riparian buffer conditions, as well as negligible channel alteration. USM data forms were completed at the upstream and downstream ends of assessed stream reaches. Stream channel, riparian buffer, instream habitat, and channel alteration conditional information were recorded for perennial and intermittent streams in the study area. The USM only requires evaluation of riparian buffer habitat condition for ephemeral streams. Other waters (including springs, streams, swales, ditches, and drainage culverts) were delineated based on the application of the hydrology parameter and the regulatory definition of OHWM (33 CFR Part 328).

Existing Conditions

The study area lies within the Middle Potomac-Catoctin watershed (Hydrologic Unit Code [HUC] 02070008) (VDCR, 2019f). The study area is also within the following subwatersheds:

- Potomac River-Difficult Run (HUC 0207000810)
- Potomac River-Nichols Run-Scott Run (HUC 020700081005)

A total of 49 streams were identified within the study area (see **Figure 3-2** and **Figure 3-3**). The identified streams include Dead Run, unnamed tributaries of the Potomac River, as well as Scott Run and several of its unnamed tributaries, which flow along the east side of the corridor and throughout the Route 267 interchange. During the field surveys, streams were classified as perennial (R3), intermittent (R4), or ephemeral (R6). In the study area, perennial streams generally had larger watersheds or were spring-fed. Flows in intermittent streams were dependent on a number of factors, including depth of the groundwater table and the discharge from feeder streams. Ephemeral streams were generally located in areas with the smallest drainage area, or areas that had drainage diverted elsewhere.

Most streams within VDOT right-of-way are fragmented in nature and show signs of historic alteration, including ditching or straightening, as well as areas of rip-rap. This alteration is primarily caused by the routing of streams through culverts and underground pipes, and under bridges which weave throughout the road network. **Figure 3-4** and **Figure 3-5** show where tributaries of Scott Run as well as wetlands associated with these streams are routed throughout the Route 267 interchange in culverts at the southern end of the study area, and where others flow through culverts under I-495 at the northern end of the study area. Streams in the northern section of the study area are mainly tributaries of Dead Run and unnamed tributaries of the Potomac River which are culverted to cross under I-495 and the GWMP. Streams identified outside of the VDOT right-of-way in undeveloped areas, such as land owned by the National Park Service (NPS), were found to be relatively undisturbed. Streams running through neighborhoods appeared to be historically altered and have since naturalized, although some still exist in culverts. All streams were found to have a “significant nexus” to offsite navigable waters and are therefore under USACE jurisdiction as identified on the USACE Preliminary Jurisdictional Determination (PJD). In heavily developed areas or within the VDOT right-of-way, the nexus is generally due to jurisdictional flow through underground pipes/culverts that discharge to the surface offsite.

Table 3-1 shows the lengths of streams identified in the study area during field surveys, categorized by flow persistence. Stream flow persistence will be confirmed during permitting and/or with County during site plan coordination.

Table 3-1. Streams in Study Area

	Perennial (R3) Linear Feet	Intermittent (R4) Linear Feet	Ephemeral (R6) Linear Feet	Total Stream Linear Feet
Total	23,010	1,356	4,593	28,959

Source: *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979)

Riverine (R) – All wetlands and deepwater habitats contained within a channel, except wetlands dominated by trees, shrubs, persistent emergent, emergent mosses, or lichens, and habitats with water containing ocean-derived salts in excess of 0.5%.

Upper Perennial, Riverine (R3) – Unknown Perennial, Riverine

Intermit, Riverine (R4) – Intermittent, Riverine

Riverine, Ephemeral (R6) – A wetland, spring, stream, river, pond or lake that only exists for a short period.

Environmental Consequences

No Build Alternative

Under the No Build Alternative, no project-related construction would occur, and therefore no changes to streams would result.

Build Alternative

Under the Build Alternative, a total of 26 streams would be directly impacted by the proposed improvements, totaling 12,821 linear feet of impacted stream assuming no new bridging is implemented to avoid or minimize impacts to these streams. Impacted streams include Scott Run and its unnamed tributaries, as well as small impacts to unnamed tributaries of the Potomac River. This total includes permanent impacts and temporary impacts, which takes into consideration impacts from potential stream relocations. During final design and permitting, the impacts to these streams will be avoided and minimized to the greatest extent practicable through bridging and other avoidance and minimization efforts.

Approximately 65% (8,376 linear feet) of the stream impacts are within VDOT right-of-way. Therefore, there would be minimal additional fragmentation of these streams and primarily extensions of existing fragmentation. Under the Build Alternative, the potential impacts to streams occurring along and parallel to the existing highway footprint cannot be minimized or mitigated by widening to the inside because the roadway does not have a median within the study area. Therefore, the only option for widening for the Express Lanes is to widen to the outside.

Impacts would occur primarily due to fill resulting from roadway widening and appurtenant features, interchange reconfiguration, culvert extensions, drainage improvements, bridge and roadway expansions, stormwater management facilities, noise barriers, and construction access. The majority of potential impacts are associated with mainline improvements.

Avoidance and minimization will be considered throughout the permitting and design process, via adjustments in construction means and methods to reduce the length of permanent and temporary stream impacts. Minor alignment shifts in localized areas could be employed to avoid lateral encroachments on particular streams; however, because the Build Alternative primarily involves expanding an existing roadway, opportunities are dependent upon the current positioning of the stream relative to the roadway crossing. During design, impacts to streams would be avoided and minimized to the maximum extent

practicable while still achieving the project's purpose and need. Unavoidable impacts to streams may require compensation.

Culverts would be countersunk and sized appropriately using VDOT drainage criteria to minimize the effects to aquatic species. In some areas, particularly Scott Run, streams may be relocated in order to preserve existing functions and values, as will be determined during final design. Temporary stream impacts would be restored to pre-construction conditions. The use of ESC measures and best management practices in accordance with the *Virginia Erosion and Sediment Control Handbook* (VESCH) will be implemented to protect receiving streams from sedimentation and runoff (VDEQ, 2019f).

Unavoidable impacts to streams will require submittal of a Joint Permit Application (JPA) to request permits from USACE, VDEQ, and VMRC as applicable. It is anticipated that Individual Permits will be required from the USACE, VDEQ, and VMRC for the Build Alternative.

In accordance with federal and state permitting requirements, compensatory mitigation is required for all unavoidable permanent impacts to streams. Compensatory mitigation requirements were calculated based on the RCI value of each impacted stream in accordance with the USM, as described above. As shown in **Table 3-2**, a total of up to 15,439 compensation credits may be required for the Build Alternative as currently proposed. For the purposes of this technical report, the USM calculations assume that all streams within the Build Alternative's LOD would be permanently impacted. However, impacts to streams will be further avoided and minimized during final design, so the required compensation is likely to decrease. Stream impacts determined to be temporary would be restored to pre-construction conditions and therefore are not anticipated to require compensatory mitigation.

All compensatory mitigation bank credits would be purchased from the same or adjacent HUC within the same watershed and physiographic province as the impact. Mitigation banks within the same HUC are restoring and preserving similar systems with similar geomorphic setting, hydrology, hydrodynamics, and functions and values; therefore, it is reasonable to assume that these banks would provide suitable, "in-kind" compensation that would replace the lost functions of the wetlands being impacted by the project.

On January 9, 2020, the USACE's Regulatory In Lieu Fee and Bank Information Tracking System (RIBITS) was queried to identify mitigation bank credits available for purchase within the same or adjacent HUC, watershed, and service area as the project. Approximately 2,245 stream credits are available from approved private mitigation banks (USACE, 2019). Credits are also available from the Northern Virginia Stream Restoration Bank, a private mitigation bank that utilizes a different credit evaluation method called the Stream Impact Assessment Method (SIAM). This method will be applied to stream lengths proposed for impact within the LOD to determine the total credit requirement. If, at the time of project permitting and construction, there are not enough compensatory mitigation credits available, the remaining credits would be purchased from an approved in-lieu fee fund. Further consideration of how many credits will be required will come during more detailed design and permitting when considerations can be made of temporary impacts and stream relocations.

Table 3-2. Estimated Stream Impacts – Build Alternative

Reach ID	Cowardian Classification	Length of Impact (Linear Feet)	Reach Condition Index	Required Compensation Credits (Linear Feet)
Waters of the U.S (WOUS) 1	R3	1,702	1.29	2,195
WOUS 3 (Scott Run)	R3	8	1.30	10
WOUS 4	R3	472	1.16	547
WOUS 5	R3	32	1.24	39
WOUS 5A	R3	25	1.24	31
WOUS 6	R3	1,219	1.16	1,414
WOUS 7 (Scott Run)	R3	670	1.30	871
WOUS 8 (Scott Run)	R3	812	1.30	1,055
WOUS 10 (Scott Run)	R3	4,618	1.30	6,003
WOUS 10A	R3	72	1.46	105
WOUS 10B	EPH	66	0.75	49
WOUS 10C	R4	197	1.34	264
WOUS 10D	EPH	79	0.73	58
WOUS 10E	R3	50	1.24	62
WOUS 10F	R4	244	1.26	307
WOUS 10G	EPH	44	0.75	33
WOUS 10H	R4	74	1.38	102
WOUS 10I	R3	31	1.20	37
WOUS 10J	R3	1,258	1.10	1,383
WOUS 10K	EPH	69	0.57	39
WOUS 11 (Bradley Branch)	R3	38	1.26	48
WOUS 16	R3	165	0.96	158
WOUS 17	R3	335	0.82	274
WOUS 20C	R4	382	0.74	283
WOUS 22	EPH	41	0.75	31
WOUS 28	EPH	118	0.30	35
Total		12,821	-	15,439

Source: USACE USM data forms (Appendix A)

WOUS = Waters of the US

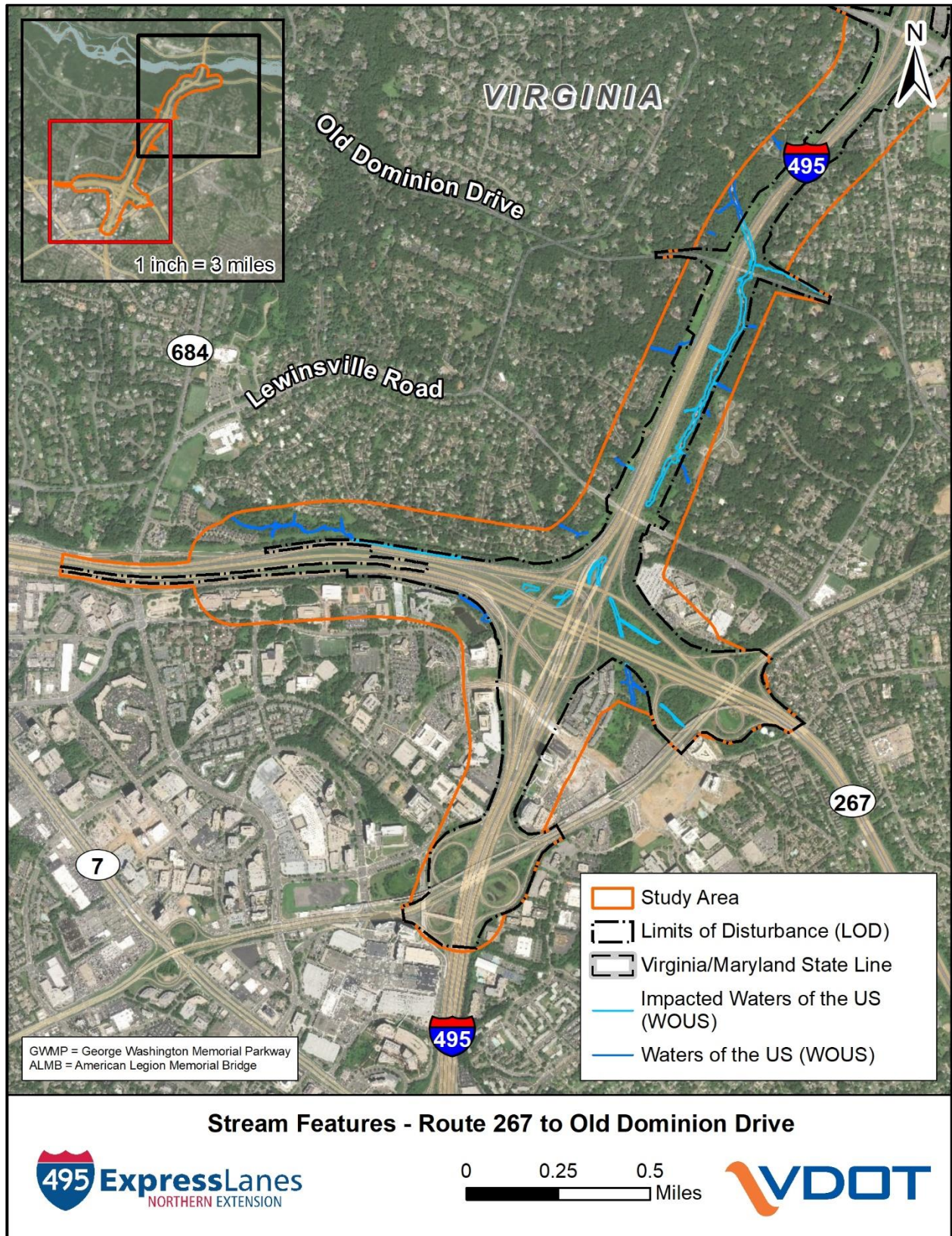


Figure 3-2. Stream Features – Route 267 to Old Dominion Drive

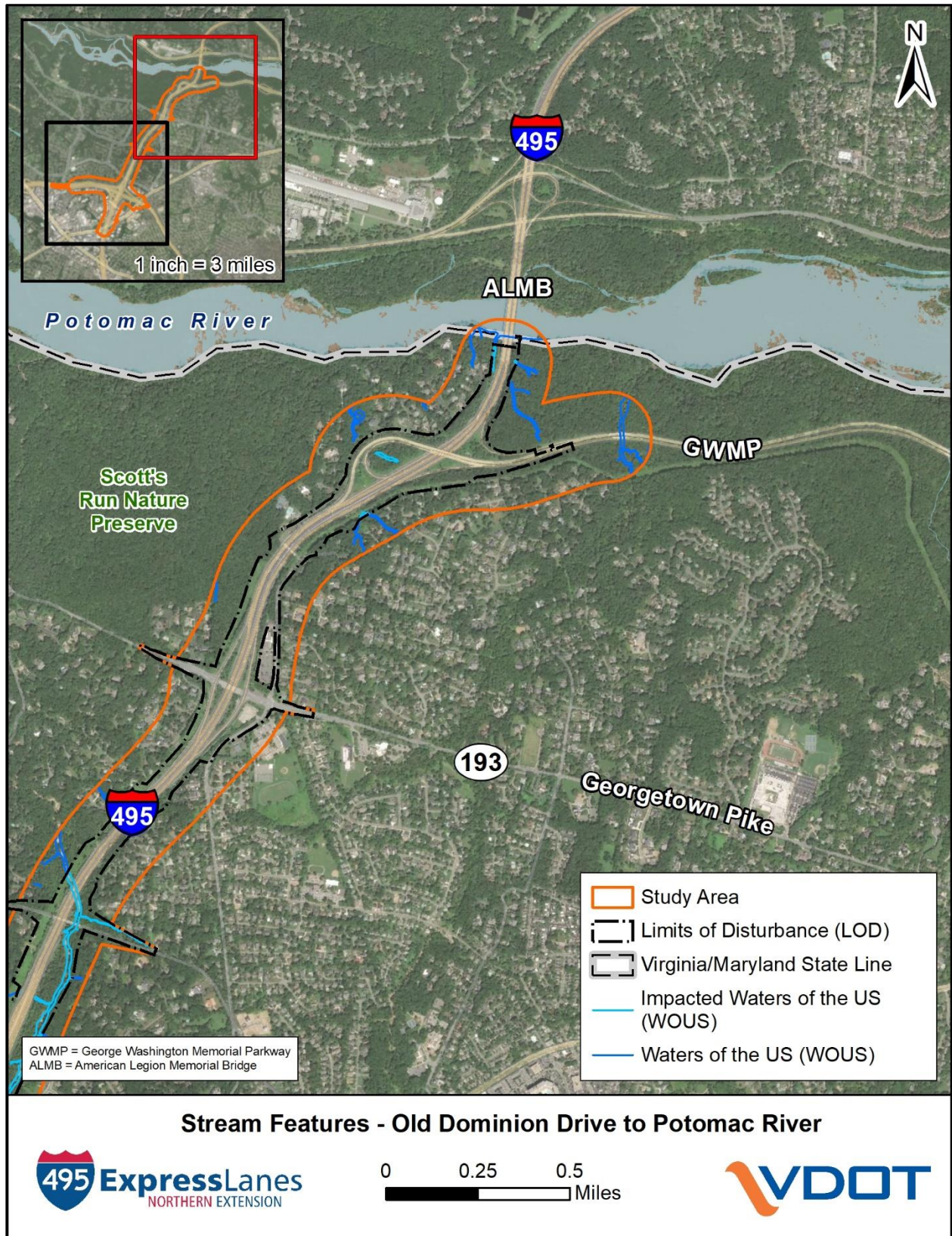


Figure 3-3. Stream Features – Old Dominion Drive to Potomac River

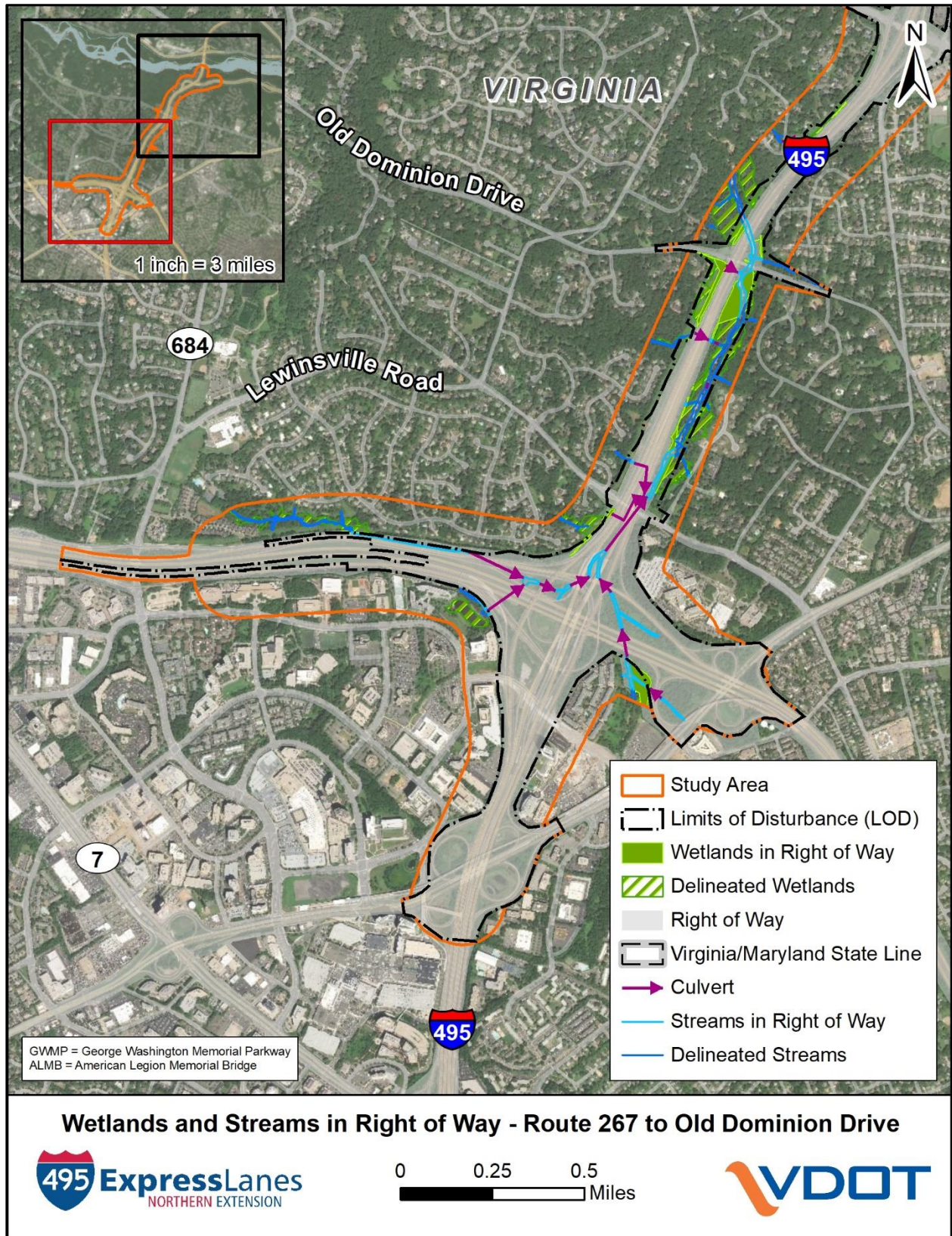


Figure 3-4. Wetlands and Streams in Right of Way – Route 267 to Old Dominion Drive

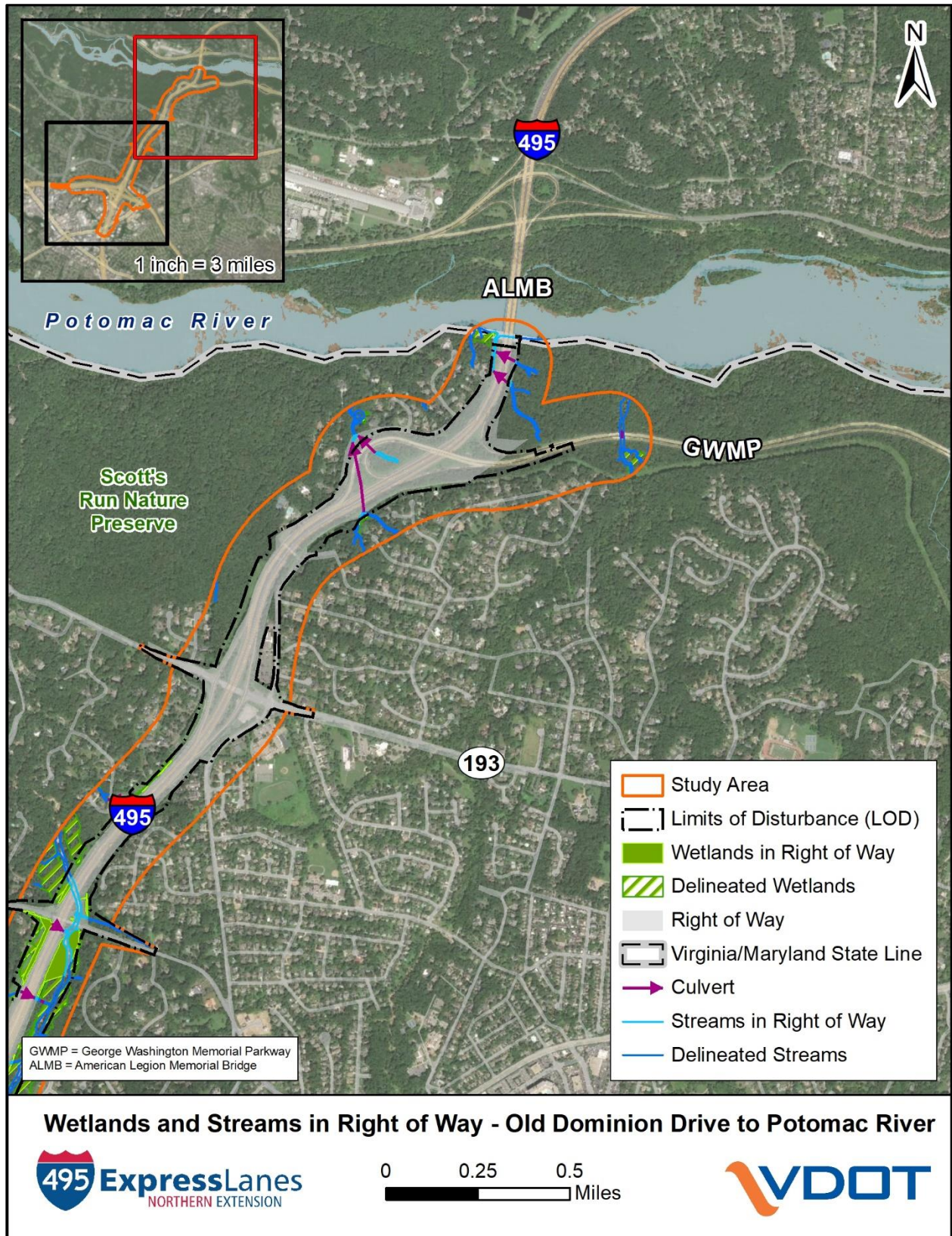


Figure 3-5. Wetlands and Streams in Right of Way - Old Dominion Drive to Potomac River

3.1.3 Wetlands

Regulatory

Wetlands provide beneficial value to an ecosystem. Wetland functions may include storage of water, groundwater recharge, flood mitigation, water purification, sediment and pollutant trapping, transformation of nutrients, wildlife habitat, and provision of nursery grounds for shellfish, fish, and other species (VDEQ, 2019j).

EO 11990, *Protection of Wetlands*, established a national wetlands policy and mandates that each federal agency acts to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance their natural value.

Wetlands are currently defined by the USACE (33 CFR §328.3[b]) and the USEPA (40 CFR §230.3[t]) as:

“...areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.”

Wetlands are federally regulated by the USEPA and USACE under Section 404 of the CWA and Section 10 of the Rivers and Harbors Appropriation Act of 1899. The USEPA and USACE share responsibility for implementing these regulations and issuing permits for discharges into WOUS (VDEQ, 2019j).

In Virginia, the VDEQ regulates activities in wetlands through the VWP Program. As with streams, a VWP permit must be obtained before disturbing a wetland by clearing, filling, excavating, draining, or ditching per Section 401 certification (VDEQ, 2019g). The Tidal Wetlands Act of 1972 emphasized the protection of tidal wetlands by delegating authority for tidal wetlands to the VMRC and VDEQ. The local wetlands board, administered through/by the VMRC, also requires permit authorization for impacts to tidal wetlands, in addition to the USACE and VDEQ.

Methodology

An investigation to identify the boundaries of WOUS, including wetlands, within the study area was performed in accordance with the USACE’s *Wetlands Delineation Manual* (USACE, 1987) and *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0)* (USACE, 2012). Wetland Determination Data Forms were completed to document representative conditions at data points in the delineated wetland and adjacent upland (**Appendix A**).

Existing Conditions

A total of 42.4 acres of wetlands have been identified in the study area (see **Table 3-3**). The wetlands identified were primarily associated with Scott Run and its unnamed tributaries, which are located along the corridor and extend down around the Route 267 interchange. Wetlands were also identified at the northern end of the study area associated with the Potomac River and Dead Run. The wetlands have been categorized based on vegetation type using the system defined by Cowardin et al. in *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979).

Wetlands observed in the study area consist of palustrine wetlands, which are freshwater wetlands with salinities below 0.5 parts-per-thousand (ppt) and maximum water depths of 6.6 feet. The majority of wetlands observed are Palustrine Forested (PFO) wetlands (85%), followed by Palustrine Emergent (PEM) wetlands (14%), and Palustrine Open-water (POW) wetlands (1%). A stormwater management facility was

also identified within the study area but is not included in these totals. Approximately 16% (7.3 acres) of the wetlands observed in the study area are located in the existing right-of-way. PEM wetlands were observed primarily on the west side of the corridor on the outside of the sound wall. PFO wetlands were observed throughout the study area, although primarily along Scott Run. One POW wetland was observed south of Old Dominion Drive on the west side of the corridor. These wetland boundaries were confirmed by the USACE in December of 2019 and a Preliminary Jurisdictional Determination (PJD) was obtained on January 15, 2020. These wetland community types were not confirmed during this process, only observed. Wetland community types will be confirmed during the permitting process with USACE and VDEQ. **Figure 3-6** and **Figure 3-7** show the location of wetlands and wetland types identified in the field reconnaissance surveys.

Wetland functions are the processes that take place within a wetland that benefit the wetland and the wetland's watershed. Wetland functions are self-sustaining properties of a wetland ecosystem that exist in the absence of society without regard to subjective human values (USACE, 1999). Wetlands within the study area serve a variety of functions that benefit the wetland and the wetland's watershed. These include, but are not limited to, habitat for fish, wildlife, and plants; improving water quality and hydrology; flood protection; protecting shorelines and stream banks from erosion; economic benefit; and recreation, education, and research (USEPA, 2018b). Based on field observations, all of the wetlands identified in the study area possess at least one of these functions.

The hydrogeomorphic (HGM) approach to assessing wetland functions groups wetlands into subclasses based on geomorphic setting, dominant water sources (i.e., hydrology), and dominant hydrodynamics. Applying the HGM methodology, most of the wetlands within the study area fall into one subclass: bottomland hardwood forests and mineral soil flat wetlands. Bottomland hardwood forests within the study area can generally be described as hardwood dominated riverine wetlands located in floodplains, river terraces, and along stream systems with hydrology being derived from groundwater and overbank flow. Further classification describes these systems in a geomorphic context as low-gradient alluvial wetlands (Brinson, 1993). Hydrodynamics are dominated by unidirectional and horizontal flow where flow velocities correspond with low-gradient landforms. Singular or multiple inflow points can be present while outlets are generally unobstructed, and typically convey surface hydrology to downstream resources. Lateral migration is present in periods when groundwater discharge or precipitation events exceed soil permeability. Reduced soil matrices generally display strong redoximorphic features providing evidence that there is a fluctuating water table.

Particularly within powerline easements along the corridor that run directly behind the sound walls, wetlands were observed to be transitioning from bottomland hardwood wetlands to palustrine persistent emergent wetlands due to human interference. PEM wetlands within the study area can generally be described as grass dominated with open canopies located in lower-lying topographic draws or depressions with hydrology mainly derived from surface water flow from higher elevations. Vegetation in these areas includes a vast array of grasslike plants such as cattails (*Typha* spp.), bullrushes (*Scirpus* spp.), saw grass (*Cladium jamaicense*), sedges (*Carex* spp.); and true grasses such as reed (*Phragmites australis*), manna grasses (*Glyceria* spp.), slough grass (*Beckmannia syzigachne*), dock (*Rumex mexicanus*), waterwillow (*Decodon verticillatus*), and many species of smartweeds (*Polygonum* spp.). Locations with dark colored soils or a muck presence indicate longer periods of saturation or inundation.

Table 3-3. Wetlands in Study Area

	Palustrine Forested (PFO) Acres	Palustrine Emergent (PEM) Acres	Palustrine Open-Water (POW) Acres	Total Wetland Acreage*
Total	35.9	6.1	0.5	42.4

Source: USACE wetland data forms (Appendix A)

*This total does not include the acreage of the stormwater management facility within the study area.

Environmental Consequences

No Build Alternative

Under the No Build Alternative, no project-related construction would occur, and therefore no changes to wetlands would result.

Build Alternative

Under the Build Alternative, a total of 19.8 acres of wetlands would be impacted, as indicated in **Table 3-4**. 37% (7.4 acres) of the wetlands impacts are within the existing VDOT right-of-way. A worst-case scenario was assumed by running calculations assuming no bridging or minimization of impacts and including impacts due to stream relocations which may result in secondary impacts to wetlands. During final design and permitting, the impacts to these wetlands will be avoided and minimized to the greatest extent practicable through bridging and other avoidance and minimization efforts potentially reducing impact quantities.

Impacts would occur primarily to wetlands associated with Scott Run, which are located along the corridor between Lewinsville Road and Old Dominion Drive. There are little to no impacts to the wetlands located in and around the Route 267 interchange, and no impacts to wetlands around the Potomac River and Dead Run. The potential impacts to wetlands within the LOD due to roadway construction would likely include discharges of fill material for culverted stream crossings, bridge approaches and abutments, and roadway cut and fill slopes. Direct impacts from cut or fill would result in a loss of wetland functions within the immediate footprint of the impacted wetlands. Depending on roadway design, cut and fill slope locations, and restoration and maintenance of vegetation following construction, the portions of these wetlands within the Build Alternative's LOD would either lose all wetland functions or have reduced functions due to a conversion in wetland type or hydrologic alteration/isolation. The magnitude of the effects to wetland functions directly impacted by conversion and hydrologic alteration or isolation is generally less than the effects from cut or fill. However, the hydrologic alteration of converting wetlands to upland through fill can affect wetland functions of nearby resources. If hydrology is maintained to the portions outside of the LOD, these wetlands would likely retain proper functions such as providing habitat, water quality benefits, and biogeochemical services.

Table 3-4. Estimated Wetland Impacts – Build Alternative

Cowardin Classification	Map ID	Estimated Wetland Impact (Acres)	Potential Compensatory Mitigation Requirements (Acres)*	Compensation Credit Ratio
PEM	W1	< 0.1	< 0.1	1:1
PFO	W3	0.5	1.0	2:1
PEM	W4	0.4	0.4	1:1
PFO	W5	13.1	26.2	2:1
PEM	W6	< 0.1	< 0.1	1:1
POW	W7A	0.4	0.2	0.5:1
PFO	W7B	0.2	0.4	2:1
PEM	W7C	2.5	2.5	1:1
PFO	W8	0.2	0.4	2:1
PEM	W9	1.4	1.4	1:1
PEM	W10	0.5	0.5	1:1
PFO	W11	< 0.1	< 0.1	2:1
Total		19.8	33.3	

Source: USACE wetland data forms (Appendix A)

*Final compensatory mitigation burdens should be calculated per VDEQ guidance

PEM = Palustrine Emergent Wetland; PFO = Palustrine Forested Wetland; POW = Palustrine Open-Water Wetland

As discussed in **Section 3.1.2**, avoidance and minimization efforts will be considered during final design, as appropriate, to reduce the acreage of permanent and temporary wetland impacts. Unavoidable impacts to wetlands, including conversion to a different wetland type or alterations to hydrology, will require submission of a JPA to request permits from USACE, VDEQ, and Local Wetlands Board as applicable. Based on the conceptual Build Alternative's LOD, it is anticipated that Individual Permits will be required from the USACE, VDEQ, and VMRC for project impacts. In accordance with federal and state permitting requirements, compensatory mitigation is required for unavoidable permanent impacts to wetlands. In Virginia, the standard compensatory mitigation ratios for impacts to non-tidal wetlands are 1:1 (one credit required per one acre of impact) for impacts to PEM wetlands, 2:1 for impacts to PFO wetlands, and 0.5:1 for impacts to POW. As shown in **Table 3-4**, a total of up to 33.3 compensation credits would be required for the Build Alternative as currently proposed. For the purposes of this technical report, compensation calculations assume that all wetlands within the Build Alternative's LOD would be permanently impacted. However, impacts to wetlands would be further avoided and minimized during final design, so the required compensation is likely to decrease.

On January 9, 2020, RIBITS was queried to identify mitigation bank credits available for purchase within the same or adjacent HUC, watershed, and service area as the project (see **Section 3.1.2**). According to RIBITS, approximately 3.98 wetland credits are available from approved private mitigation banks in the primary service area of the study area (USACE, 2019). Avoidance and minimization will be considered

throughout the permitting and design process. If, at the time of project permitting and construction, there are not enough compensatory mitigation credits available, the remaining credits would be purchased from an approved in-lieu fee fund. Further consideration of how many credits will be required will come during more detailed design and permitting phases.

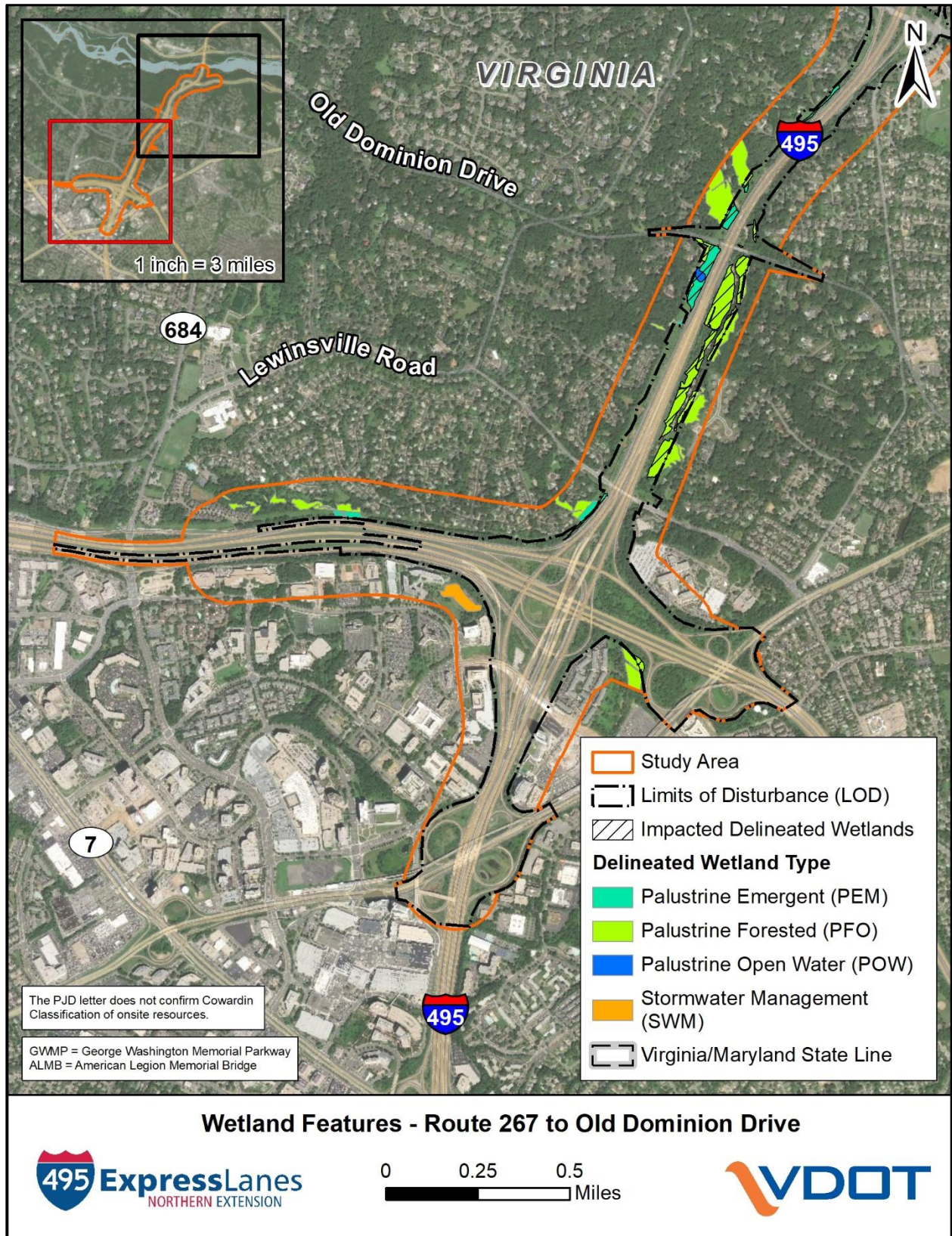


Figure 3-6. Wetland Features – Route 267 to Old Dominion Drive

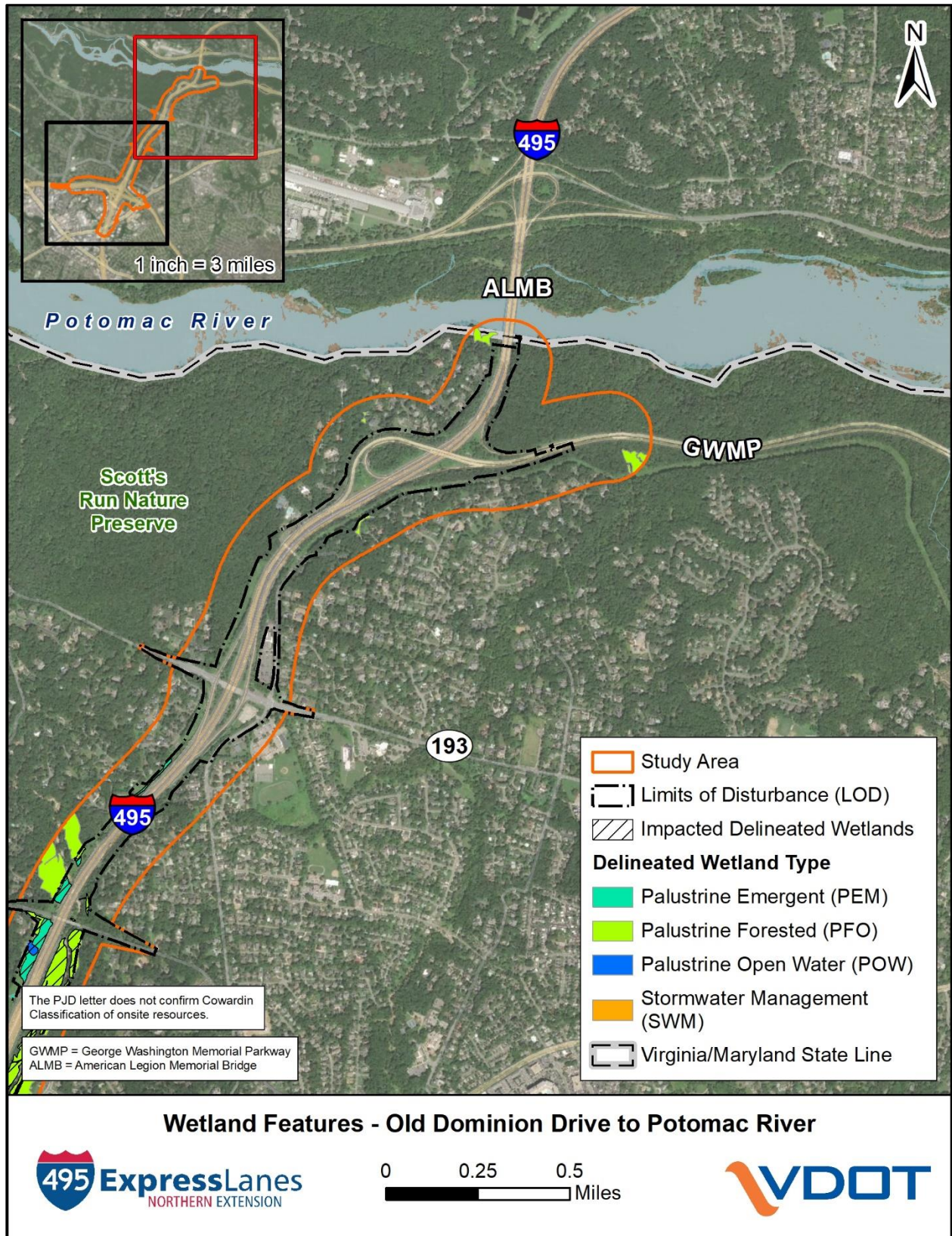


Figure 3-7. Wetland Features – Old Dominion Drive to Potomac River

3.1.4 Floodplains

Regulatory

Several federal directives regulate construction in floodplains to ensure that consideration is given to avoidance and mitigation actions that can be taken to preserve natural floodplain services. These federal directives include the National Flood Insurance Act of 1968, EO 11988, and U.S. Department of Transportation (USDOT) Order 5650.2, entitled “Floodplain Management and Protection.”

The National Flood Insurance Act of 1968 established the National Flood Insurance Program (NFIP), which is administered by FEMA. In Virginia, the VDCR is responsible for coordination of all state floodplain programs (VDCR, 2019a). Development within floodplains is also regulated by local flood insurance programs administered by localities under the NFIP.

The 100-year flood, or base flood, is the area covered by a flood that has a 1% 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. The 500-year floodplain is the area covered by a flood that has a 0.2% chance of occurring in any given year. These regulations and definitions are relevant for this analysis because the proposed project may result in impacts to floodplains.

The VDCR floodplain management program and VDOT construction specifications for roadways also address roadway construction within floodplains. Sections 107 and 303 of VDOT’s *Road and Bridge Specifications* require the use of stormwater management practices to address issues such as post-development storm flows and downstream channel capacity (VDOT, 2019b). These standards require that stormwater management be designed to reduce stormwater flows to preconstruction conditions for up to a 10-year storm event. As part of these regulations, the capture and treatment of the first half-inch of runoff in a storm event is required, and all stormwater management facilities must be maintained in perpetuity.

Fairfax County practices floodplain management and participates in the NFIP, and activities within their floodplains may require written approval from the Fairfax County Department of Public Works and Environmental Services, or a Special Exception approval issued by the Board of Supervisors (Fairfax County, 2019b).

Methodology

FEMA is required to identify and map the nation’s flood-prone areas through the development of Flood Insurance Rate Maps (FIRMs). Digital floodplain data from the National Flood Hazard Layer (NFHL) was obtained from the FEMA Flood Map Service Center (FEMA, 2019) and plotted in the study area to determine the location and extent of floodplain areas and/or presence of floodways.

Existing Conditions

Approximately 94.1 acres of 100-year floodplains are located within the study area. **Table 3-5.** details the number of acres of floodplains associated with each waterway in the study area. Floodplains associated with three waterways are currently crossed by the existing I-495 facilities. The approximate locations of the floodplain limits are provided in **Figure 3-8.** No designated floodways were identified within the study area.

Table 3-5. 100-Year Floodplains in Study Area

Waterway	100-Year Floodplains (Acres)
Potomac River	3.6
Dead Run	4.3
Scott Run	86.2
Total	94.1

Source: FEMA, 2019

Environmental Consequences

No Build Alternative

Under the No Build Alternative, no project-related construction would occur, and therefore no changes to floodplains would result.

Build Alternative

Approximately 60 acres of floodplains are located within the Build Alternative's LOD and are anticipated to be impacted (see **Table 3-6**). A worst-case scenario was assumed by running calculations assuming no bridging or minimization of impacts and including impacts due to stream relocations. During final design and permitting the impacts within these floodplains will be reduced to the greatest extent practicable through bridging and other avoidance and minimization efforts. Once stream relocations are designed, impacts within the floodplains will be evaluated. All floodplains within the Build Alternative's LOD are associated with Scott Run which runs through the center of the study area between Old Dominion Drive and through the Route 267 interchange, and Dead Run which is located within NPS land in the northeast corner of the study area.

Table 3-6. Estimated 100-Year Floodplain Impacts – Build Alternative

Waterway	Estimated 100-Year Floodplain Impact (Acres)
Scott Run	60
Total	60

Source: FEMA, 2019

*These values are expected to decrease after additional project-specific floodplain analysis is completed during final design.

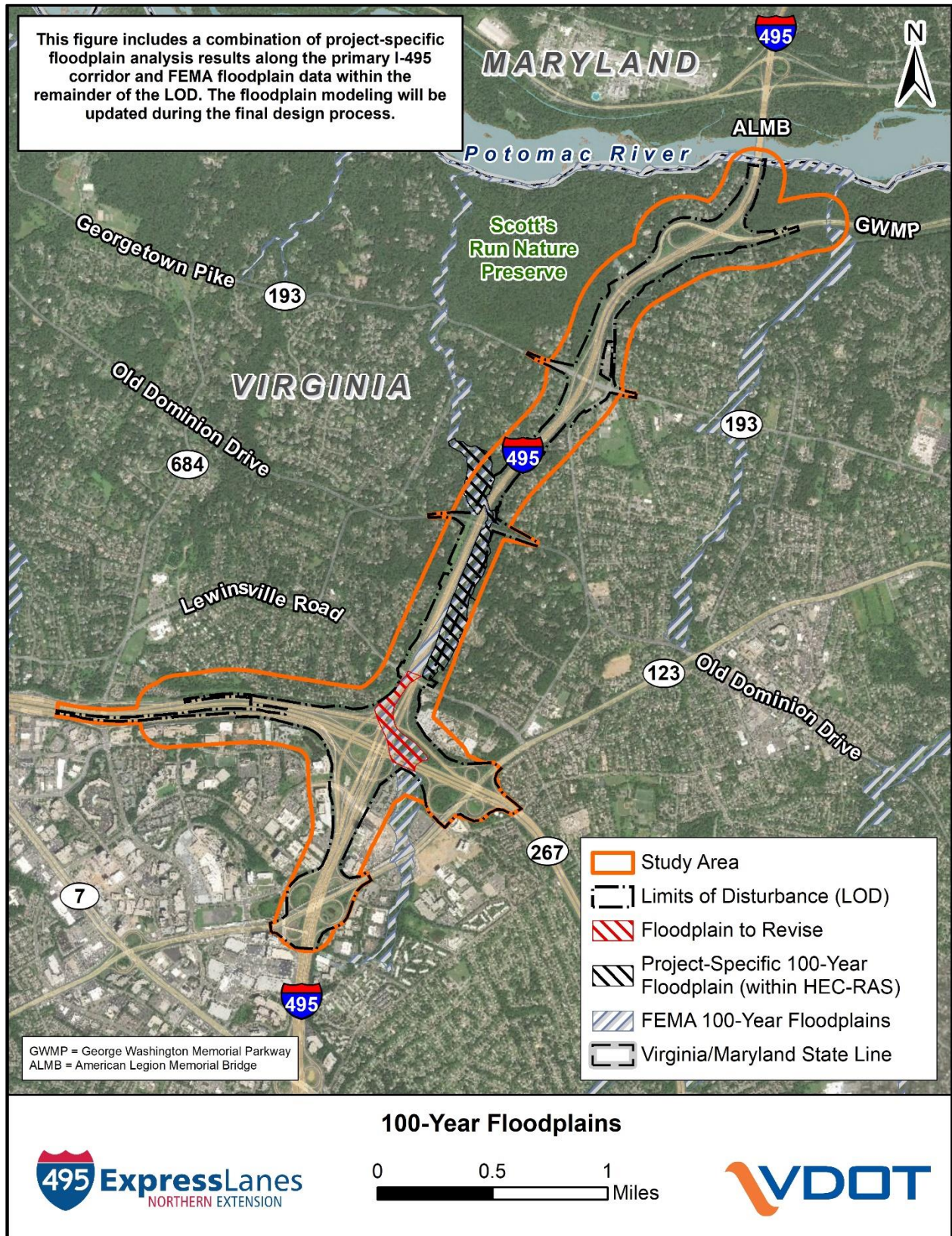


Figure 3-8. 100-Year Floodplains

Filling in floodplains could result in loss of floodplain functions. Floodplain encroachment could potentially alter the hydrology of the floodplain, which could indirectly result in more severe flooding in terms of flood height, duration, and erosion. However, the Build Alternative is not expected to result in an adverse impact to floodplains. The project design for the Build Alternative would be consistent with federal policies and procedures for the location and hydraulic design of highway encroachments on floodplains contained in 23 CFR 650 Subpart A. The proposed project would not, therefore, increase flood levels and would not increase the probability of flooding or the potential for property loss and hazard to life. Further, the proposed project would not be expected to have substantial effects on natural and beneficial floodplain values. The proposed project would be designed so as not to encourage, induce, allow, serve, support, or otherwise facilitate incompatible base floodplain development. It is anticipated that the potential floodplain encroachments would not be a “significant encroachment” (as defined in 23 CFR 650.105(q)) because:

- It would pose no significant potential for interruption or termination of a transportation facility that is needed for emergency vehicles or that provides a community's only evacuation route;
- It would not pose significant flooding risks; and
- It would not have significant adverse impacts on natural and beneficial floodplain values.

Efforts to minimize floodplain encroachment will be considered during final design to avoid or minimize impacts on natural and beneficial floodplain values.

3.1.5 Aquifers/Water Supply

Regulatory

Congress enacted the Safe Drinking Water Act (SDWA) in 1974 and amended and reauthorized it in 1986 and 1996. This Federal law ensures the quality of Americans’ drinking water and authorizes the USEPA to set national standards for drinking water to protect against health effects from exposure to naturally-occurring and man-made contaminants. These drinking water standards only apply to public water systems, and the USEPA works with states, localities, and water suppliers to maintain these standards (USEPA, 2017b).

The USEPA’s Sole Source Aquifer (SSA) program (authorized by Section 1424(e) of the SDWA of 1974 [Public Law 93-523, 42 USC 300 et. seq.]) enables the agency to designate an aquifer as a sole source of drinking water and subsequently establish a review area for each aquifer.

The USEPA defines an SSA as one where the aquifer supplies at least 50% of the drinking water for its service area, and there are no reasonably available alternative drinking water sources should the aquifer become contaminated (USEPA, 2018a). The USEPA has the authority to review proposed projects that both receive federal funding and are located within an aquifer’s review area.

The Code of Virginia (VAC 15.2-2223 and VAC 15.2-2284) lays out groundwater protection provisions for local governments to consider when developing Comprehensive Plans and zoning ordinances; however, the selection of management methods to protect groundwater is determined at the local level. The Virginia Department of Health (VDH) manages the Source Water Assessment Program (SWAP), which delineates an assessment area for each public drinking water source in Virginia and maintains a GIS-based inventory of potential contaminants per source (VDH, 2019).

VDEQ, under the Ground Water Management Act of 1992, manages groundwater withdrawals in certain areas called Groundwater Management Areas (GWMA). A GWMA is defined as a geographically defined groundwater area in which the State Water Control Board has deemed the levels, supply, or quality of groundwater to be adverse to public welfare, health, and safety (9 VAC 25-600). Virginia currently has two GWMA:

- **Eastern Virginia GWMA**—Comprises all areas east of Interstate 95
- **Eastern Shore GWMA**—Includes Accomack and Northampton Counties

Any project located within either of the two Virginia GWMA must obtain a permit to withdraw 300,000 gallons or more of groundwater within any one month (VDEQ, 2019i).

Methodology

The USEPA's National SSA GIS Layer was used to determine the boundaries of SSAs and to plot these in relation to the study area (USEPA, 2017a). Information on groundwater and underlying aquifers was obtained from VDEQ's Ground Water Withdrawal Permitting Program (VDEQ, 2019i). Nearby reservoirs and public water supply were identified using VDEQ's "What's in my Backyard" online mapper and GIS shapefiles of this information were also obtained from the VDEQ (VDEQ, 2019e). Scoping letter responses from the VDH Office of Drinking Water received on July 27, 2018 and Fairfax Water received on July 26, 2018 were referenced for public groundwater wells, surface water intakes, and public surface water intake watershed presence in the vicinity of the project.

Existing Conditions

No public ground water wells, surface water intakes, springs, reservoirs, or sole source aquifers were identified within the study area. The study area is not within a GWMA as defined by VDEQ (VDEQ, 2019i). Fairfax Water is a wholesale customer of the Washington Aqueduct's Little Falls intake, located approximately three miles downstream of the study area. The Washington Aqueduct's Little Falls intake pulls water from the Potomac River and treats it to use as drinking water (DC Water, 2017). Therefore, all tributaries of the Potomac River between Chain Bridge and the Monacacy River are considered public water supply (VDEQ, 2019e). This includes Scott Run and its tributaries, and Dead Run and its tributaries, which are within the study area (see **Appendix A**). Distances from the study area to the nearest aquifers and water supplies are shown in **Figure 3-9**.

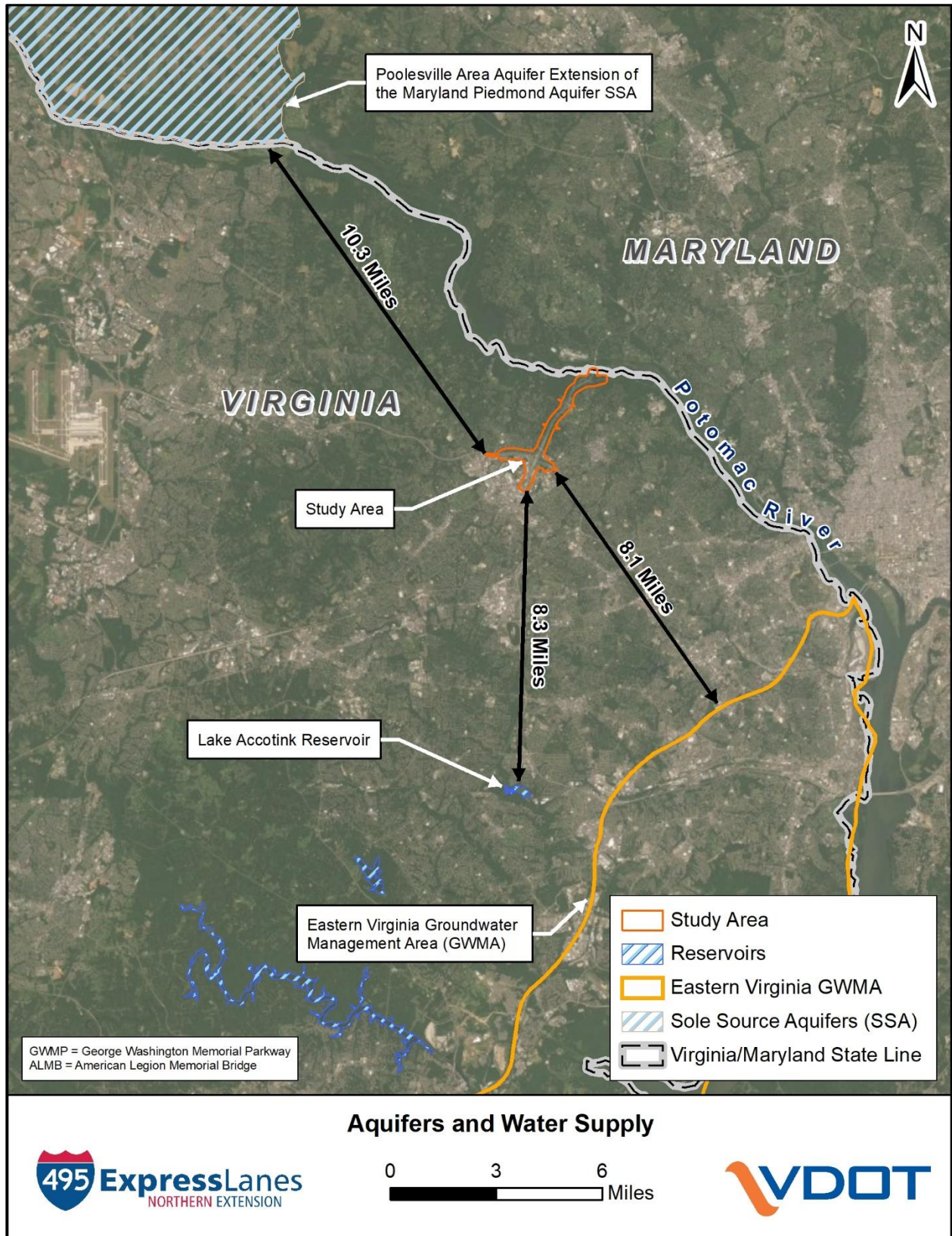


Figure 3-9. Aquifers and Water Supply

Environmental Consequences

No Build Alternative

Under the No Build Alternative, no project-related construction would occur, and therefore no changes to aquifers, groundwater, or public water sources would result. Areas along the I-495 corridor where stormwater management features are absent or outdated, potentially impacting public water sources outside the study area, would not be improved under the No Build Alternative.

Build Alternative

Implementation of the Build Alternative is not expected to affect public water resources as it is not within a GWMA. Excavation associated with the project is not anticipated to encounter the groundwater table. As discussed in **Section 3.1.1**, by complying with the SWPPP, ESC plan, and the CGP, potential sedimentation or pollution of water quality in public water sources would be minimized.

3.1.6 Submerged Aquatic Vegetation

Regulatory

Submerged aquatic vegetation (SAV) is essential for the health of the Chesapeake Bay. SAV includes an assemblage of underwater plants found in shallow waters of the Chesapeake Bay and its river tributaries as well as coastal bays of Virginia (NOAA, 2019a). SAV beds filter polluted runoff, provide food for waterfowl, help improve water quality, and serve as habitat for aquatic species such as blue crabs and juvenile rockfish (VIMS, 2019).

In Virginia, VMRC has jurisdiction over subaqueous bottoms or bottomlands (VAC 28.2-101) and is directed to map the boundaries of existing SAV beds in consultation with VIMS (VAC 28.2-1204). Any removal of SAV from state bottom or planting of nursery stock SAV for any purpose other than pre-approved research or scientific investigation, requires prior approval by VMRC (4 VAC 20-337-30). Any request to remove SAV from or plant SAV on state bottomlands must be accompanied by a completed Joint Permit Application (JPA), submitted to VMRC.

Methodology

VIMS monitors and maintains a database for the presence and health of SAV in the Chesapeake Bay and its watershed (VIMS, 2017). Since 2001, VIMS has been documenting the extent of SAV beds as part of the Annual SAV Monitoring Program. VIMS maintains this information in an online interactive mapper, which depicts SAV beds in the Chesapeake Bay region dating back to 1971. GIS data containing the locations of SAV beds were obtained from the VIMS SAV program for their 2017 survey year (VIMS, 2017). SAV data for the 2018 survey year has been released but is not yet available for regions of the Potomac River closest to the study area, therefore the 2017 survey year data was utilized. This data was overlain with the study area to determine the location of previously identified SAV beds in relation to the study area.

Existing Conditions

Per the VIMS SAV program 2017 survey, there are no acres of SAV within or adjacent to the study area. The nearest SAV beds to the study area are located approximately 4.6 miles southeast of the study area in the Potomac River. **Figure 3-10** shows the location of all SAV beds near the project study area.

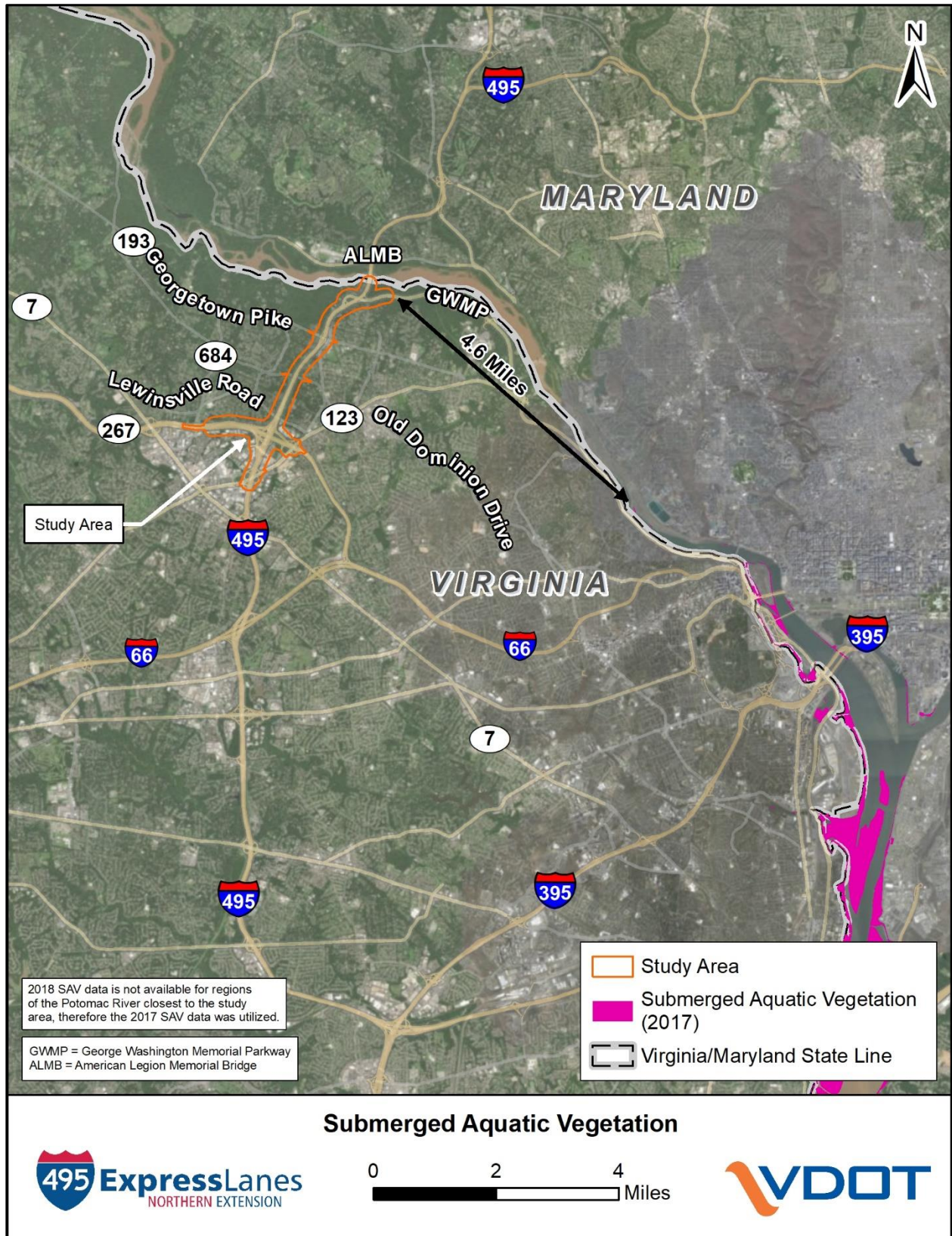


Figure 3-10. Closest Submerged Aquatic Vegetation to the Study Area

Environmental Consequences

No Build Alternative

Under the No Build Alternative, no project-related construction would occur, and therefore no changes to SAV beds would result. Areas along the I-495 corridor where stormwater management features are absent or outdated would not be improved under the No Build Alternative.

Build Alternative

The nearest identified SAV bed is in the Potomac River, 4.6 miles away from the study area. The Build Alternative's LOD does not intersect the Potomac River, and therefore implementation of the Build Alternative would not result in any impacts to SAV.

3.2 TERRESTRIAL RESOURCES

3.2.1 Wildlife and Wildlife Habitat

Regulatory

According to VDGIF, habitat is defined as the essential elements that a given wildlife species needs to survive, including food, water, and shelter (VDGIF, 2019e). Development projects can lead to habitat fragmentation and loss of critical habitat for both terrestrial and aquatic species. Habitat loss can have serious consequences for the survivability of wildlife populations.

USFWS and VDGIF act as consulting agencies under the United States Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), and provide environmental analysis of projects or permit applications coordinated through the Federal Energy Regulatory Commission (FERC), USACE, and other state or federal agencies (VDGIF, 2020). Their role in these procedures is to determine likely impacts on fish and wildlife resources and their habitats, and to recommend appropriate measures to avoid, reduce, or compensate for those impacts. **Section 3.3.2** contains regulatory specifics pertaining to threatened and endangered species.

VDCR Department of Natural Heritage (VDCR-DNH) conserves Virginia's natural resources through programs such as biological inventories, natural community inventory and classification, and the creation of Natural Area Preserves throughout the state (VDCR, 2019c). In addition, VDCR-DNH identifies Conservation Sites, which represent key areas of the landscape worthy of protection and stewardship action because of the natural heritage resources and habitat they support (VDCR, 2018). Conservation Sites are given a biodiversity significance ranking based on the rarity, quality, and number of element occurrences they contain on a scale of B1-B5, with B1 being the most significant.

Methodology

The 2016 Virginia Land Cover Dataset provided by the Virginia Geographic Information Network (VGIN) was reviewed to determine the types of wildlife habitat within the study area (VGIN, 2016). All land cover types except developed land are assumed to be potential wildlife habitat. Plant species were identified during field reconnaissance and recorded on wetland data forms (see **Appendix A**). VGIN was also used to identify land area types including forested, cleared, maintained, and developed lands. Cleared land is defined as pasture and scrub/shrub, forestland is forest and trees, maintained is turf grass, and developed land is impervious surfaces including roads and homes. Park boundaries within the study area were also identified using shapefiles from NPS and the Fairfax County Geospatial database (NPS, 2020; Fairfax County, 2019f).

The VDGIF Virginia Fish and Wildlife Information Service (VaFWIS) was used to obtain a list of species confirmed and/or likely to occur within two miles of the study area (VDGIF, 2019b). This database search result is provided in **Appendix B**.

The VDCR Natural Heritage Data Explorer (NHDE) was used to identify any conservation sites or managed conservation lands within the study area (VDCR, 2019g). GIS data from Fairfax County was also reviewed to identify natural lands and recreational facilities near or within the study area. Further coordination with VDCR regarding potential resources within the study area is ongoing.

Existing Conditions

Several types of available wildlife habitat are located within the study area and are classified by VGIN as: forest, tree, hydro, turfgrass, pasture, scrub/shrub, and NWI/Other (VGIN, 2016). Similar types were combined in **Table 3-7** and **Figure 3-11** to indicate similar habitat types. Available wildlife habitat accounts for approximately 641 acres of the study area (see **Table 3-7**), and approximately 221 acres of this habitat is within existing VDOT right-of-way, approximately 35%. This available wildlife habitat is within or immediately adjacent to the active I-495 corridor, therefore the quality of the habitat has been impacted by this use.

Wildlife habitat types within the study area are shown in **Figure 3-11**.

Table 3-8 shows the acreages of forested, cleared, maintained, and developed lands within the study area.

Table 3-7 Wildlife Habitat in Study Area

Wildlife Habitat Type	Acreage within Right of Way	Acreage Outside of Right of Way	Total Potential Habitat in Study Area
Forest/Tree	105.9	294.6	400.5
Hydro/NWI/Other	3.7	5.5	9.2
Turfgrass/Pasture	110.8	112.7	223.5
Scrub/Shrub	1.0	6.8	7.8
Total	221.4	419.6	641.0

Source: VGIN, 2016

Note: Where appropriate, some land cover types were combined to reflect similar types in total.

Table 3-8. Land Areas Present in Study Area

Land Area Type	Within Study Area (Acres)
Forested	400.5
Cleared	10.2
Maintained	221.0
Developed	447.9
Total	1,079.6

Source: VGIN, 2016

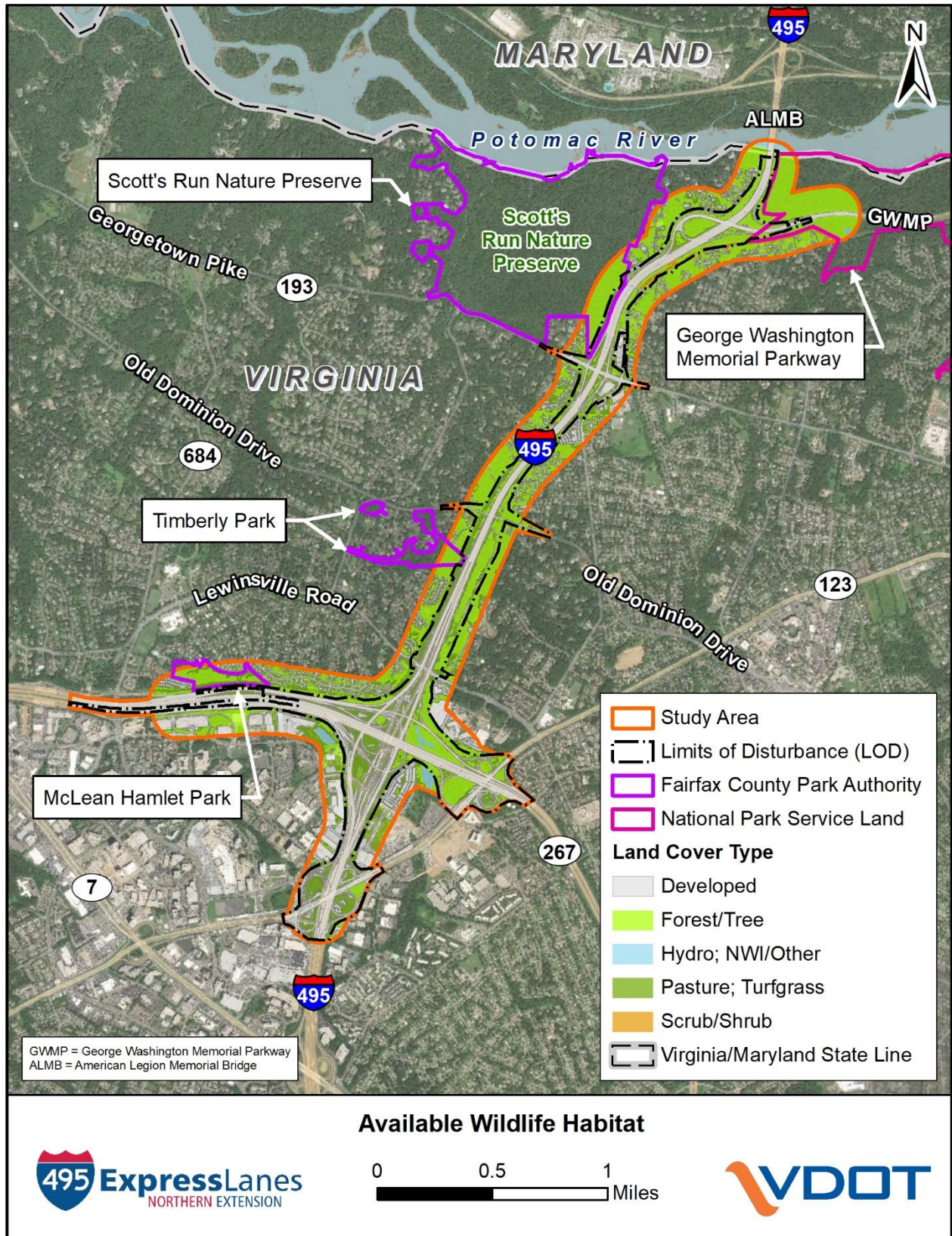


Figure 3-11. Available Wildlife Habitat

Scotts Run Stream Valley Park, Westgate Park, Ken Lawrence Park, McLean Hamlet Park, Falstaff Park, McLean Knolls Park, Timberly Park, Churchill Road Park, Cooper Intermediate School Site, Langley Oaks Park, and Scott's Run Nature Preserve are natural areas identified within or in close proximity to the study area which feature a mix of natural lands and recreational facilities (Fairfax County, 2019c). Parks owned by the Fairfax County Park Authority (FCPA) or NPS can be seen in **Figure 3-11**. There are no wildlife refuges within or in close proximity to the study area. VDCR-NHDE identified the Potomac Gorge (which generally follows the boundary of the Potomac River) as a conservation site within the study area, and Timberly Park, Scotts Run Stream Valley, and McLean Hamlet as locally managed conservation lands (VDCR, 2019g).

Wildlife habitat is present in the study area, as shown in **Figure 3-11**. However, extensive portions of the study area adjacent to the existing roadway have been developed for residential, commercial, or industrial purposes which has led to less natural forest cover and an increase in impervious surfaces and turfgrass. The existing roadway forms major habitat fragmentation of forested areas posing a virtually impenetrable barrier to crossings by terrestrial species due to vehicle strikes and the presence of fence lines that bound the highway. Culverts connecting streams under roadways offer limited passage, and the habitat fragments result in low-quality edge habitat. The edge habitat along the highway in the right-of-way, interchange loops, and the area in the median is poor habitat for wildlife due to access restrictions posed by the travel lanes. The wildlife species most capable of adapting to habitat fragmentation outside of the fence line of the existing roadway are primarily species that are adapted to urban environments.

The forestlands remaining in the study area are typical of Oak-Hickory forest. The forested areas within the study area provide habitat for many of the typical terrestrial urban wildlife species inhabiting this region. Vegetation identified during the field surveys indicates that the study area is dominated by a mix of red maple (*Acer rubrum*), tulip poplar (*Liriodendron tulipifera*) and red oak (*Quercus rubra*) trees and saplings. Dominant shrub species recorded include northern spicebush (*Lindera benzoin*), winter holly (*Ilex verticillata*), and pawpaw (*Asimina triloba*). Herbaceous species recorded include Kentucky bluegrass (*Poa pratensis*), Japanese stiltgrass (*Microstegium vimineum*), and a mix of *Carex* species. Commonly observed vine species include roundleaf greenbriar (*Smilax rotundifolia*), poison ivy (*Toxicodendron radicans*), and grape vine (*Vitis* spp).

In Virginia, insect species are considered natural heritage resources and are regulated by the Virginia Department of Agriculture and Consumer Services (VDACS), with VDCR-DNH commenting on their behalf.

The species shown in **Table 3-9** include those that are commonly found within the study area, as well as those that are state and federally protected as identified by the VDGIF VaFWIS. Please refer to **Section 3.3.2** for detailed information on how the Build Alternative would impact those species that are state and federally protected.

Table 3-9. Species Within 2-Mile Radius of Study Area (VDGIF VaFWIS)

Common Name	Scientific Name	Presence	Status
Little Brown Bat	<i>Myotis lucifugus</i>	Likely to Occur	SE
Tri-Colored Bat	<i>Perimyotis subflavus</i>	Likely to Occur	SE
Wood Turtle	<i>Glyptemys insculpta</i>	Confirmed	ST
Big Brown Bat	<i>Eptesicus fuscus</i>	Likely to Occur	
Woodland Box Turtle	<i>Terrapene carolina</i>	Confirmed	
Queen Snake	<i>Regina septemvittata</i>	Confirmed	
American Bullfrog	<i>Lithobates catesbeianus</i>	Confirmed	
Green Frog	<i>Lithobates clamitans</i>	Confirmed	
Pickerel Frog	<i>Lithobates palustris</i>	Confirmed	
Wood Frog	<i>Lithobates sylvaticus</i>	Confirmed	
Eastern Red-Backed Salamander	<i>Plethodon cinereus</i>	Confirmed	
Long-Tailed Salamander	<i>Eurycea longicauda</i>	Confirmed	
Northern Dusky Salamander	<i>Desmognathus fuscus</i>	Confirmed	
Northern Red Salamander	<i>Pseudotriton ruber</i>	Confirmed	
Northern Two-Lined Salamander	<i>Eurycea bislineata</i>	Confirmed	
Three-Lined Salamander	<i>Eurycea guttolineata</i>	Confirmed	
White-Spotted Slimy Salamander	<i>Plethodon cylindraceus</i>	Confirmed	
Dekay's Brownsnake	<i>Storeria dekayi</i>	Confirmed	
Eastern Copperhead	<i>Agkistrodon contortrix mokasen</i>	Confirmed	
Eastern Gartersnake	<i>Thamnophis sirtalis</i>	Confirmed	
Northern Rough Greensnake	<i>Opheodrys aestivus</i>	Confirmed	
Northern Mole Kingsnake	<i>Lampropeltis calligaster rhombomaculata</i>	Confirmed	
Eastern Fence Lizard	<i>Sceloporus undulatus</i>	Confirmed	
Northern Black Racer	<i>Coluber constrictor</i>	Confirmed	
Eastern Ratsnake	<i>Pantherophis alleghaniensis</i>	Confirmed	
Common Five-Lined Skink	<i>Plestiodon fasciatus</i>	Confirmed	
Northern Ring-Necked Snake	<i>Diadophis punctatus edwardsii</i>	Confirmed	
Eastern Painted Turtle	<i>Chrysemys picta</i>	Confirmed	
Northern Watersnake	<i>Nerodia sipedon</i>	Confirmed	
Eastern Wormsnake	<i>Carphophis amoenus</i>	Confirmed	
Brown Creeper	<i>Certhia Americana</i>	Confirmed	
Wild Turkey	<i>Meleagris gallopavo silvestris</i>	Confirmed	
American Eel	<i>Anguilla rostrate</i>	Confirmed	
Largemouth Bass	<i>Micropterus salmoides</i>	Confirmed	

Common Name	Scientific Name	Presence	Status
Smallmouth Bass	<i>Micropterus dolomieu</i>	Confirmed	
Striped Bass	<i>Morone saxatilis</i>	Confirmed	
Bluegill	<i>Lepomis macrochirus</i>	Confirmed	
Yellow Bullhead	<i>Ameiurus natalis</i>	Confirmed	
Common Carp	<i>Cyprinus carpio</i>	Confirmed	
Blue Catfish	<i>Ictalurus furcatus</i>	Confirmed	
Channel Catfish	<i>Ictalurus punctatus</i>	Confirmed	
Creek Chub	<i>Semotilus atromaculatus</i>	Confirmed	
Blacknose Dace	<i>Rhinichthys atratulus</i>	Confirmed	
Longnose Dace	<i>Rhinichthys cataractae</i>	Confirmed	
Rosyside Dace	<i>Clinostomus funduloides</i>	Confirmed	
Fantail Darter	<i>Etheostoma flabellare</i>	Confirmed	
Tessellated Darter	<i>Etheostoma olmstedi</i>	Confirmed	
Longnose Gar	<i>Lepisosteus osseus</i>	Confirmed	
Goldfish	<i>Carassius auratus</i>	Confirmed	
Bluntnose Minnow	<i>Pimephales notatus</i>	Confirmed	
Eastern Silvery Minnow	<i>Hybognathus regius</i>	Confirmed	
Silverjaw Minnow	<i>Ericymba buccatus</i>	Confirmed	
Eastern Mosquitofish	<i>Gambusia holbrooki</i>	Confirmed	
Pumpkinseed	<i>Lepomis gibbosus</i>	Confirmed	
Potomac Sculpin	<i>Cottus Girardi</i>	Confirmed	
Gizzard Shad	<i>Dorosoma cepedianum</i>	Confirmed	
Common Shiner	<i>Luxilus cornutus</i>	Confirmed	
Satinfin Shiner	<i>Cyprinella analostana</i>	Confirmed	
Spotfin Shiner	<i>Cyprinella spiloptera</i>	Confirmed	
Spottail Shiner	<i>Notropis hudsonius</i>	Confirmed	
Swallowtail Shiner	<i>Notropis procne</i>	Confirmed	
Central Stoneroller	<i>Campostoma anomalum</i>	Confirmed	
Northern Hogsucker	<i>Hypentelium nigricans</i>	Confirmed	
White Sucker	<i>Catostomus commersonii</i>	Confirmed	
Green Sunfish	<i>Lepomis cyanellus</i>	Confirmed	
Redbreast Sunfish	<i>Lepomis auritus</i>	Confirmed	
Red Swamp Crayfish	<i>Procambarus clarkii</i>	Confirmed	

Source: VDGIF, 2019b

SE = State Endangered; ST = State Threatened

Environmental Consequences

No Build Alternative

Under the No Build Alternative, no project-related construction would occur, and therefore no changes to wildlife habitat would result. The existing extent and mix of land cover types, levels of fragmentation, and presence of invasive species would be unchanged under the No Build Alternative.

Build Alternative

Under the Build Alternative, approximately 51.4 acres of land not currently being used for transportation would be converted to transportation use. There would be approximately 118 acres of tree clearing associated with the construction of the project due to the widening of the roadway, ramps and interchange re-configurations, noise walls, stormwater management facilities, and all other appurtenant structures. 75% (88 acres) of this tree clearing will occur within existing right of way, meaning areas that already abut or are contained within the transportation facility. Increasing the width of the roadway corridor would not likely exacerbate the problems posed to wildlife movement, as forested land would not be newly separated from contiguous forest. The existing highway facility and other barriers currently prevent terrestrial wildlife from crossing the travel lanes, and currently existing corridors would be maintained by extending culverts and bridges, therefore no elimination of existing wildlife passages is anticipated.

Approximately 80% (186.5 acres) of the available wildlife habitat that would be impacted under the Build Alternative consists of maintained or previously disturbed vegetation within the existing I-495 right-of-way. Only approximately 3% (7.3 acres) of the available wildlife habitat within the Build Alternative's LOD is contained within protected lands, including Scott's Run Nature Preserve managed by the FCPA and the GWMP managed by NPS. The direct impacts to available wildlife habitat under the Build Alternative are included in **Table 3-10**.

The direct impacts to parkland owned by FCPA and NPS can be seen in **Figure 3-11** as well as **Table 3-11**.

Table 3-10. Estimated Available Wildlife Habitat Impacts – Build Alternative

Available Wildlife Habitat Type	Acreage within Right of Way	Acreage Outside Right of Way	Acreage within Protected Areas (NPS & FCPA)	Total Acreage within LOD
Forest/Tree	88.0	25.8	4.0	117.8
Hydro/NWI/Other	1.6	0.0	0.0	1.6
Turfgrass/Pasture	95.9	11.3	3.3	110.5
Scrub/Shrub	1.0	2.5	0.0	3.5
Total	186.5	39.6	7.3	233.4

Source: VGIN, 2016

Note: Where appropriate, some land cover types were combined to reflect similar types in total.

Table 3-11. Estimated Park Land Impacts - Build Alternative

Park Land	Impact (Acres)
Fairfax County Park Authority (Scott's Run Nature Preserve, Timberly Park, McLean Hamlet Park)	3.2
National Park Service Land (George Washington Memorial Parkway)	4.7
Total	9.4

Source: NPS, 2020; Fairfax County, 2019f

During agency scoping, the Potomac Gorge was identified as a conservation site by DCR-NHDE (dated December 20, 2019, see **Appendix B**). This resource generally follows the boundary of the Potomac River in both Maryland and Virginia. Work within this site may impact the natural heritage resources that are supported there. DCR recommends limiting the project footprint in these areas to the maximum extent possible, and to conduct surveys to identify resources within areas proposed for disturbance so potential impacts can be more accurately evaluated. Necessary surveys and agency coordination will be completed later in project development and impacts to this resource will be avoided and minimized to the maximum extent practicable.

3.2.2 Invasive Species

Regulatory

VDCR-DNH defines invasive plants as species intentionally or accidentally introduced by human activity into a region in which they did not evolve and, as a result, those that could cause harm to natural resources, economic activity, or humans (VDCR, 2019b). In accordance with EO 13112, Invasive Species, as amended, no federal agency can authorize, fund, or carry out any action that it believes is likely to cause or promote the introduction or spread of invasive species. Other regulations in governing invasive species include the Non-Indigenous Aquatic Nuisance Prevention and Control Act of 1990 (as amended), Lacey Act of 1900 (as amended), Plant Protection Act of 2000, Federal Noxious Weed Act of 1974 (as amended), and the Endangered Species Act of 1973 (as amended). Likewise, the state of Virginia acted in 2003 to amend the Code of Virginia by adding the Nonindigenous Aquatic Nuisance Species Act, which, among other things, addresses the development of strategies to prevent the introduction of, to control, and to eradicate invasive species.

Methodology

VDCR-DNH identifies and maintains a list of invasive plant species that are known to currently threaten Virginia's natural populations (VDCR, 2019f). The list is divided into three regions: Coastal, Piedmont, and Mountain. The study area falls entirely within the Coastal region, as delineated for the Virginia Invasive Plant Species List. To date, VDCR has listed 82 invasive plant species for the Coastal region (VDCR, 2019e). The list classifies each species by level of invasiveness (High, Medium, Occasional). Highly invasive species generally disrupt ecosystem processes and cause major alterations in plant community and overall structure. They can easily establish themselves in undisturbed habitats and colonize disturbed areas rapidly under the appropriate conditions. While plants with medium and low invasiveness can become management problems, they tend to have fewer adverse effects on natural systems and are more easily managed. This list, as well as field reconnaissance was used to identify potential invasive plant species

within the study area. Plant species were identified during field reconnaissance and recorded on wetland data forms (see **Appendix A**).

Existing Conditions

Common invasive species observed in the study area include Japanese stiltgrass (*Microstegium vimineum*), Japanese honeysuckle (*Lonicera japonica*), Chinese privet (*Ligustrum sinense*), mile-a-minute (*Persicaria perfoliata*), and multiflora rose (*Rosa multiflora*). These species exist primarily within disturbed areas or where conditions are conducive to their success. Examples of this within the study area include; powerline easements, along roadways, or where other disturbances have taken place.

Environmental Consequences

No Build Alternative

The presence of invasive species would be unchanged under the No Build Alternative.

Build Alternative

In accordance with EO 13112, Invasive Species, the spread of invasive species would be minimized by following provisions in VDOT's *Road and Bridge Specifications* (VDOT, 2019b). These provisions require prompt seeding of disturbed areas with mixes that are tested in accordance with the Virginia Seed Law and VDOT's standards and specifications.

Specific seed mixes that are free of noxious or invasive species may be required for environmentally sensitive areas and would be determined during the design and permitting process. Because much of the construction under the Build Alternative would occur along existing disturbed corridors, the introduction of invasive plant species is expected to be minimal.

3.2.3 Topography and Soils

Regulatory

The Farmland Protection Policy Act of 1981 (FPPA) (7 USC 4201) is administered by USDA NRCS and is intended to minimize the impact of federal programs on unnecessary and irreversible conversion of farmland to nonagricultural uses. Under the FPPA, "farmland" is defined as:

- **Prime farmland**—Land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses
- **Unique farmland**—Land other than prime farmland that is used for production of specific high-value food and fiber crops
- **Farmland other than prime or unique**—Farmland that is of statewide or local importance for the production of food, feed, fiber, forage, or oilseed crops

Importantly, though prime and unique farmlands are designated independently of current land use, they cannot be areas of urban or built-up land, as defined by the United States Census (USDA, 2019b), or within existing transportation right-of-way.

Statewide, construction activities along steep slopes (equal to or steeper than 3:1) require the use of soil stabilization or blankets in accordance with the standards and specifications of the VESCH (VDEQ, 2019f). Locally, Fairfax County requires any projects with land-disturbing activities exceeding 2,500 square feet to prepare an erosion and sediment control plan (Fairfax County, 2019e).

The County must approve each plan before any land-disturbing activities begin, and each project is subject to inspections throughout the duration of land-disturbing activities to prevent erosion and sediment control violations.

Methodology

Soils data for Fairfax County was acquired using the NRCS Web Soil Survey online database (USDA, 2019a). An evaluation conducted in GIS determined the location and extent of soils, including farmland soils, in the study area. Existing transportation right-of-way and lands designated as “urban areas” by the U.S. Census Bureau were excluded from the farmland analysis.

Topographic contour data for Fairfax County was acquired from the Fairfax County GIS department (Fairfax County, 2019c). An evaluation conducted in GIS determined the topographic conditions in the study area.

Existing Conditions

Fairfax County’s topography is characterized by rolling hills formed from a mix of igneous and metamorphic rock. **Figure 3-12** depicts the topography in the study area. Surface elevation in the county ranges from sea level to approximately 500 feet above sea level.

The study area contains a wide variety of soil types. **Table 3-12** lists the soil types in the study area as depicted in **Figure 3-13**.

The majority of the study area is within the Washington, D.C.–Virginia–Maryland Urbanized Area as designated by the 2010 Census, where farmland protection policies do not apply. Approximately 80 acres of the study area are outside of the Urbanized Area. This area is located west of I-495 north of Georgetown Pike. **Table 3-13** lists the acreages of protected farmland soils within portions of the study area subject to the Farmland Protection Policy Act. There are approximately 19 acres of farmland of statewide importance and 23 acres of prime farmland within the study area. Approximately 7% of the prime and 11% of the statewide important farmland soils identified in the study area occur within the existing right-of-way. **Figure 3-14** shows the extent of these soils in the study area.

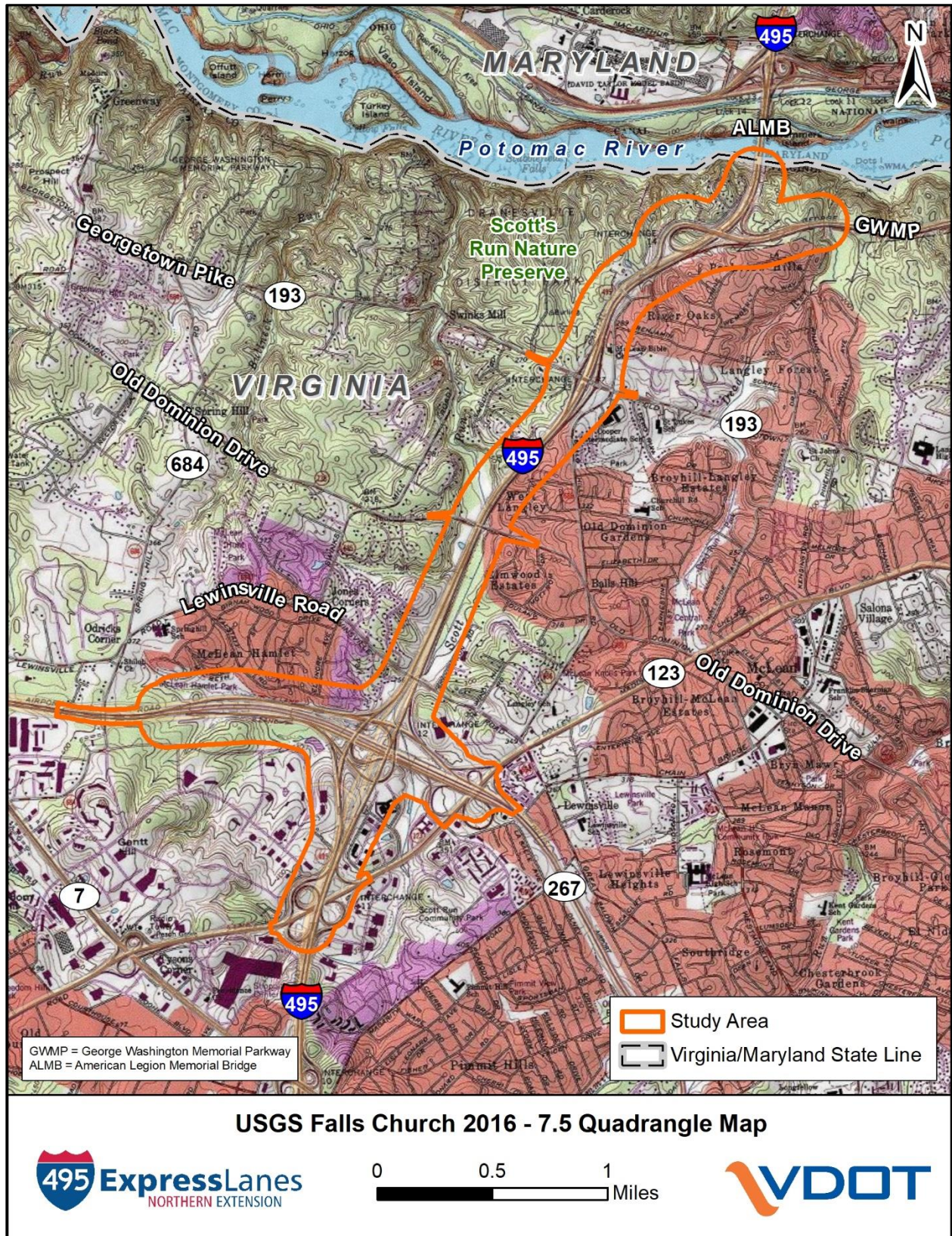


Figure 3-12. USGS Topographic Map

Table 3-12. Soils in Study Area

Map Unit Symbol ^a	Soil Map Unit Name	Acres of Soil Type Found in Study Area	Percentage of Soil Type Found in Study Area
29A	Codorus silt loam, 0 to 2 percent slopes, occasionally flooded	95.0	8.8%
30A	Codorus and Hatboro soils, 0 to 2 percent slopes, occasionally flooded	20.8	1.9%
39B	Glenelg silt loam, 2 to 7 percent slopes	22.9	2.1%
39C	Glenelg silt loam, 7 to 15 percent slopes	125.5	11.6%
39D	Glenelg silt loam, 15 to 25 percent slopes	91.0	8.4%
39E	Glenelg silt loam, 25 to 45 percent slopes	62.5	5.8%
49A	Hatboro silt loam, 0 to 2 percent slopes, frequently flooded	7.5	0.7%
78B	Meadowville loam, 2 to 7 percent slopes	14.2	1.3%
88E	Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	9.0	0.8%
93B	Sumerduck loam, 2 to 7 percent slopes	5.2	0.5%
95	Urban land	335.3	31.1%
101	Urban land-Wheaton complex	20.2	1.9%
102	Wheaton loam, 2 to 25 percent slopes	66.3	6.1%
103A	Wheaton-Codorus complex, 0 to 2 percent slopes	5.1	0.5%
105B	Wheaton-Glenelg complex, 2 to 7 percent slopes	24.4	2.3%
105C	Wheaton-Glenelg complex, 7 to 15 percent slopes	86.7	8.0%
105D	Wheaton-Glenelg complex, 15 to 25 percent slopes	45.0	4.2%
106A	Wheaton-Hatboro complex, 0 to 2 percent slopes, frequently flooded	5.9	0.5%
107B	Wheaton-Meadowville complex, 2 to 7 percent slopes	21.2	2.0%
108B	Wheaton-Sumerduck complex, 2 to 7 percent slopes	11.1	1.0%
W	Water	4.1	0.4%

Source: NRCS Web Soil Survey online database (USDA, 2019a)

^aSee **Figure 3-13** Soil Classifications within the Study Area

Table 3-13. Soils Subject to the Farmland Protection Policy Act in Study Area

Map Unit Symbol ^a	Soil Map Unit Name	Prime Farmland Designation	Acres of Soil Type Found in Study Area	Percentage of Soil Type Found in Study Area
39B	Glenelg silt loam, 2 to 7 percent slopes	P	16.4	2.1%
39C	Glenelg silt loam, 7 to 15 percent slopes	SI	18.4	11.9%
39D	Glenelg silt loam, 15 to 25 percent slopes	SI	1.0	8.4%
39E	Glenelg silt loam, 25 to 45 percent slopes	NP	15.7	5.9%
78B	Meadowville loam, 2 to 7 percent slopes	P	6.3	1.3%
88E	Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	NP	1.6	0.9%
95	Urban land	NP	3.2	30.3%
101	Urban land-Wheaton complex	NP	4.0	1.9%
105B	Wheaton-Glenelg complex, 2 to 7 percent slopes	NP	2.1	2.3%
105C	Wheaton-Glenelg complex, 7 to 15 percent slopes	NP	4.8	8.2%
105D	Wheaton-Glenelg complex, 15 to 25 percent slopes	NP	3.4	4.3%
107B	Wheaton-Meadowville complex, 2 to 7 percent slopes	NP	1.0	1.9%
Total Protected Soils				
Prime Farmland			22.7 acres	2.84%
Farmland of Statewide Importance			19.4 acres	9.94%

Source: NRCS Web Soil Survey online database (USDA, 2019a)

N = Not Prime Farmland; SI = Farmland of Statewide Importance; PF = Prime Farmland

Environmental Consequences

No Build Alternative

Under the No Build Alternative, no project-related construction would occur, and therefore no changes to topography or soils, including prime and unique farmland, would result.

Build Alternative

Construction activities involving earthmoving, clearing vegetation, grubbing, and grading would disturb soils and increase the potential for soil erosion and sedimentation within wetlands and waterways. Other activities, such as the placement of culverts, construction of stormwater retention and detention basins, movement of construction vehicles and machinery, movement and stockpiling of excavated soils, and the placement of fill throughout the LOD would cause additional soil disturbances. These soil disturbances are expected to be generally minor, short-term, and localized. Estimated impacts to prime and unique soils are estimated to be 8.0 acres within the Build Alternative's LOD and can be seen in **Table 3-14**.

Table 3-14. Estimated Soil Impacts – Build Alternative

Prime and Unique Soil Type	Impact (Acres)
Prime Farmland or Farmland of Statewide Importance	8.0
Not Prime Farmland or Farmland of Statewide Importance	6.5
Total	14.5

Source: NRCS Web Soil Survey online database (USDA, 2019a)

Activities occurring in steeply sloped areas and in highly erodible soils present the greatest potential for erosion and stormwater pollution during construction. The extent and permanence of effects from erosion and stormwater pollution are dependent on the measures used for erosion and sediment control. Strict adherence to erosion and sediment control measures and plans would be required throughout all construction practices.

A total of 8.0 acres of protected farmland soils would be impacted under the Build Alternative, including 4.8 acres of prime farmland and 3.2 acres of farmland of statewide importance, which are located outside of a designated urban area. The Farmland Protection Policy Act requires that federal agencies review impacts to prime, unique, or important farmlands when providing financial or technical assistance for state highway construction projects. However, roadway projects with direct and indirect impacts totaling less than ten acres per linear mile or impacts to areas already in urban use are exempt from adherence to the Farmland Protection Policy Act. Therefore, this project is exempt.

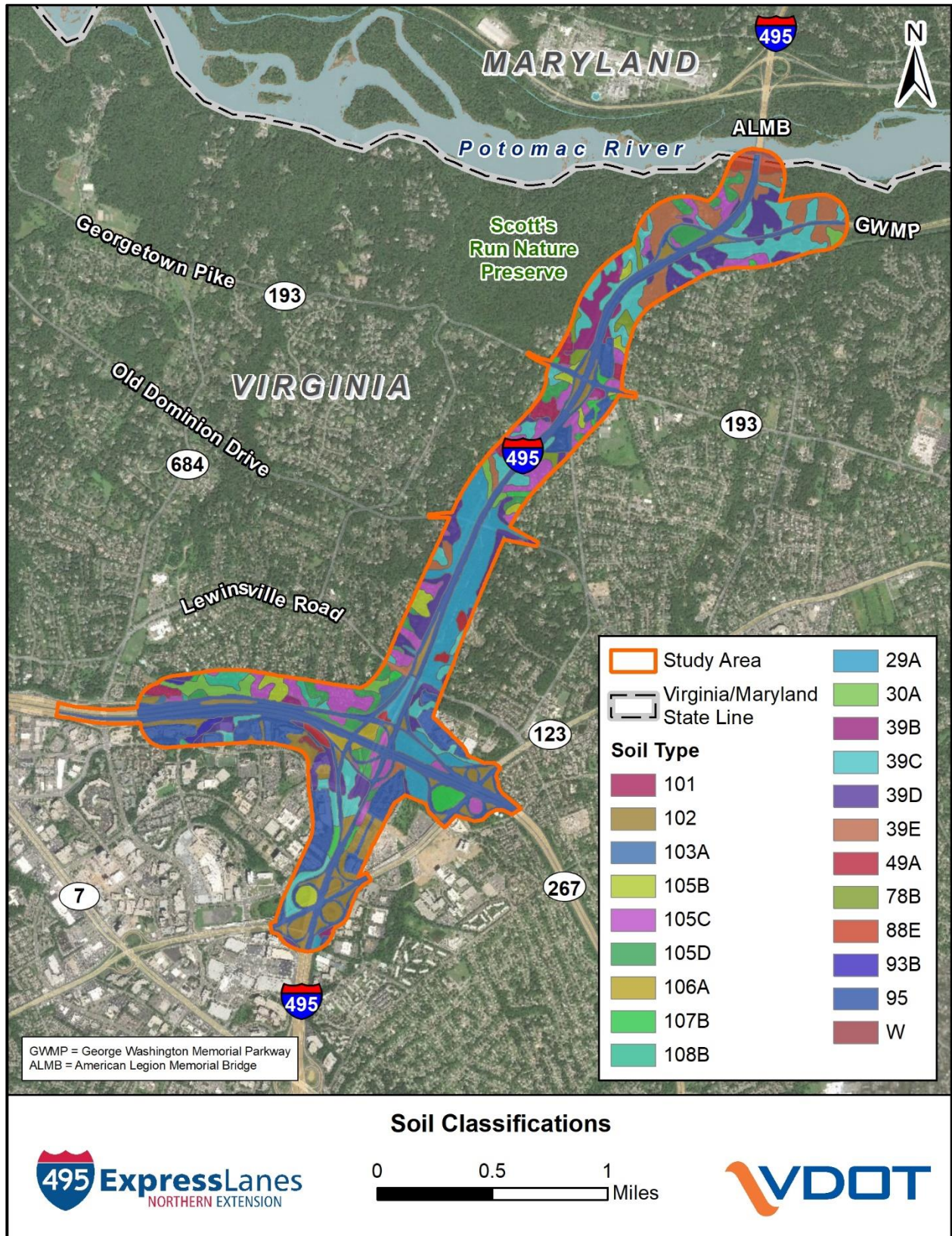


Figure 3-13. General Soil Classifications

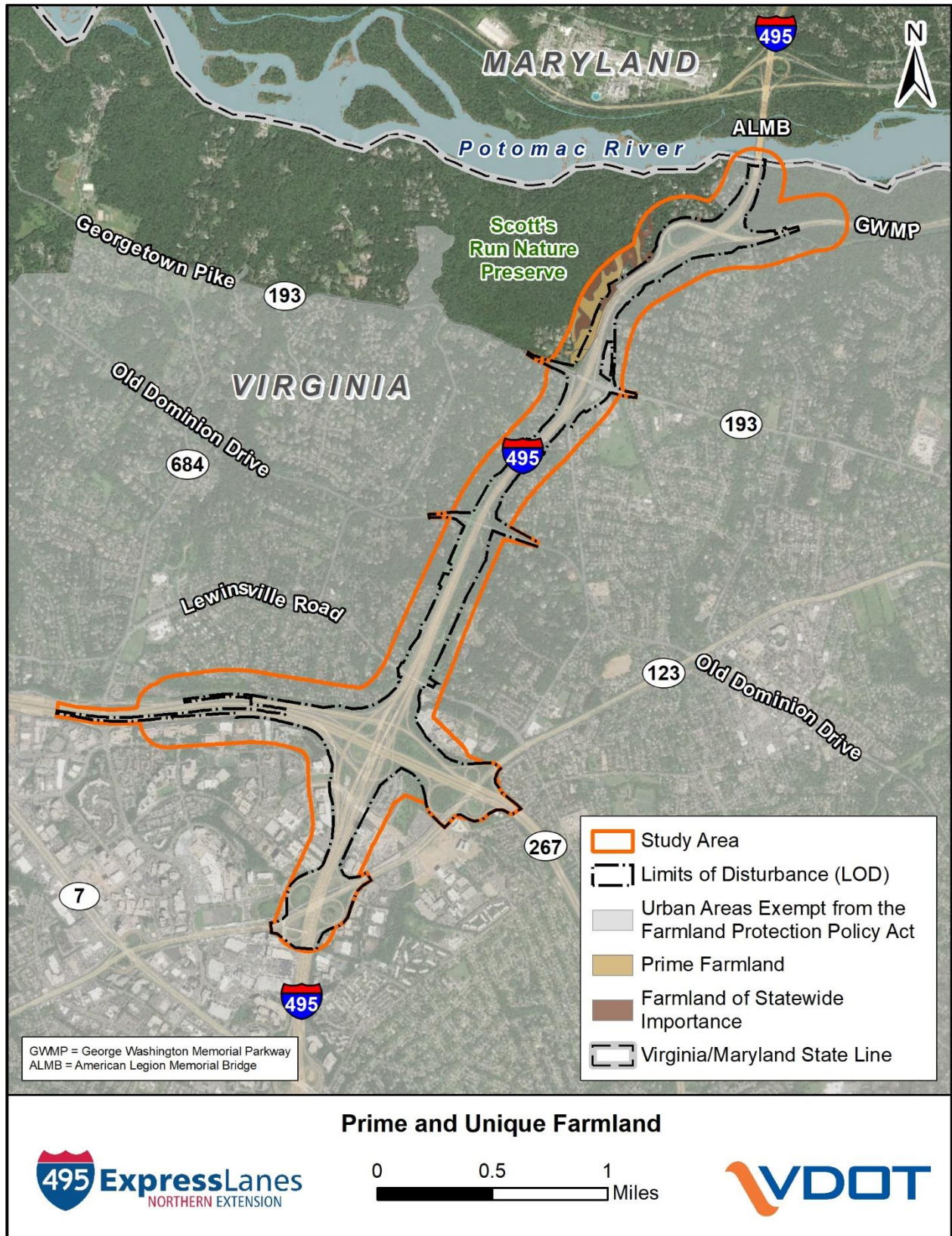


Figure 3-14. Prime and Unique Farmland Subject to the Farmland Protection Policy Act

3.2.4 Chesapeake Bay Preservation Areas

Regulatory

The Chesapeake Bay Preservation Act (CBPA) was enacted by the Virginia General Assembly in 1988 to protect and manage Virginia's coastal zone. The CBPA is designed to improve water quality in the portion of the Chesapeake Bay watershed that falls within the state of Virginia through effective land management and land use planning. The CBPA requires of tidewater localities to design and implement flexible programs that address water quality goals while also integrating each locality's unique local characteristics and community goals (VDEQ, 2019a).

According to the Fairfax County Chesapeake Bay Preservation Ordinance (CBPO), Resource Protection Areas (RPA) include tidal wetlands, tidal shores, water bodies with perennial flow, and non-tidal wetlands connected by surface flow and contiguous to tidal wetlands or perennial water bodies, as well as a 100-foot vegetated buffer area located adjacent to and landward of these features and any land within major floodplains associated with these features (VDEQ, 2019b). When preserved in their natural condition, RPAs preserve water quality by removing excess sediment, nutrients, and potentially harmful substances from groundwater and surface water prior to their entrance into the Chesapeake Bay. RPAs also serve as protected habitat and corridors for wildlife use and movement and perform other important biological and ecological functions (9 VAC 25-830-80). Lands contained in designated RPAs are afforded protections restricting their development.

Resource Management Areas (RMA) include those lands contiguous to the inland boundary of the RPA, which, if improperly used or developed, have the potential to degrade water quality or diminish functions of the RPA. RMAs include floodplains, highly erodible soils (including steep slopes), highly permeable soils, non-tidal wetlands not included in RPAs, and any other sensitive land considered by the local government to be necessary to protect the quality of water resources (9 VAC 25-830-90). Areas of existing development and infill sites where little of the natural environment remains within Chesapeake Bay Preservation Areas may be designated as Intensely Developed Areas (IDA) by the local government (9 VAC 25-830-100). According to the Fairfax County CBPO, all areas within Fairfax County that are outside of RPAs and IDAs are considered RMAs (Fairfax County, 2019a).

Methodology

RPA data for Fairfax County is available online through the county's Digital Map Viewer (Fairfax County, 2019f). An evaluation conducted in GIS determined the location and extent of RPAs in the study area. Verification of RPAs through site specific investigation will be done during final design in accordance with Section 118-1-9 of the Fairfax County CBPO (Fairfax County, 2019a).

Existing Conditions

According to available data, there are approximately 152.6 acres of RPA lands within the study area. Waterways subject to RPAs include the Potomac River, Scott Run, Dead Run, Bradley Branch and their respective tributaries. The RPA lands are shown in **Figure 3-15**. **Table 3-15** depicts the acreage of RPA lands per waterway within the study area.

Table 3-15. Resource Protection Areas in Study Area

Waterway	Resource Protection Area Acreage
Potomac River	7.2
Potomac River – Unnamed Tributaries	2.5
Dead Run	9.0
Scott Run	92.5
Bradley Branch	4.5
Scott Run – Unnamed Tributaries	36.9
Total	152.6

Source: Fairfax County, 2019f

Environmental Consequences

No Build Alternative

Under the No Build Alternative, no project-related construction would occur, and therefore no changes to RPAs or any associated resources would result. Areas along the I-495 corridor where stormwater management features are absent or outdated would not be improved under the No Build Alternative.

Build Alternative

The Build Alternative would result in approximately 76.1 acres of temporary and permanent impacts to RPAs. Although the RPAs are protected resources, public roads and their appurtenant structures are conditionally exempt from regulation under the Virginia Administrative Code (9 VAC 25-830-150), provided that the roadway is designed and constructed in accordance with water quality protection criteria at least as stringent as VDOT requirements, and in accordance with the Virginia Erosion and Sediment Control Law (§ 62.1-44.15:51 through § 62.1-44.15:66 of the Code of Virginia) and the Stormwater Management Act (§ 62.1-44.15:24 through § 62.1-44.15:50 of the Code of Virginia). The exemption of public roads is further conditioned on the optimization of the road alignment and design, consistent with other applicable requirements, to prevent or otherwise minimize encroachment in RPAs and adverse effects on water quality. Direct impacts of the Build Alternative on RPAs can be seen in **Table 3-16**.

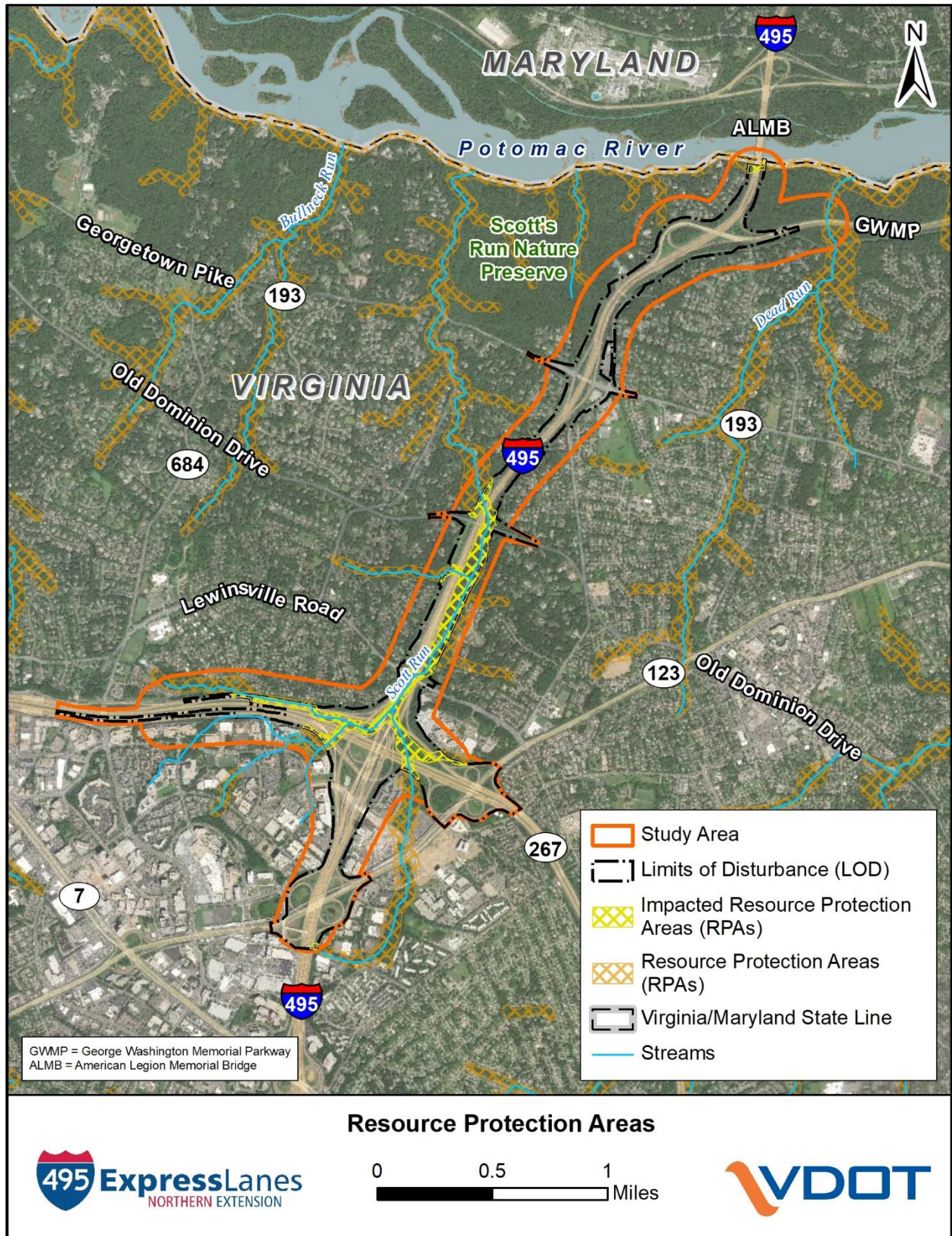


Figure 3-15. Resource Protection Areas

Table 3-16. Estimated Resource Protection Area Impacts – Build Alternative

Waterway	Impact (Acres)
Potomac River	1.2
Scott Run	60.4
Bradley Branch	1.6
Scott Run – Unnamed Tributaries	12.3
Total	75.5

Source: Fairfax County, 2019f

Since the Build Alternative would meet the exemption conditions, its construction would not be under the CBPA purview. Therefore, contingent upon the above conditions being met, and the final design is optimized to limit encroachment into RPAs, no additional mitigation for RPA impacts is necessary.

3.2.5 Virginia Coastal Zone Management Areas

Regulatory

Pursuant to the federal Coastal Zone Management Act (CZMA) of 1972, as amended, and its implementing regulations in Title 15, Code of Federal Regulations, Part 930, federal activities, including permits, licenses, and federally funded projects, located in Virginia’s Coastal Management Area or those that can have reasonably foreseeable effects on Virginia’s coastal uses or coastal resources must be conducted in a manner which is consistent, to the maximum extent practicable, with the enforceable policies of the Virginia Coastal Zone Management Program (CZM). The Virginia CZM is a “networked program,” meaning the program relies on a network of state agencies and local governments to administer the enforceable laws and regulations that protect wetlands, dunes, subaqueous lands, fisheries, and air and water quality within Virginia’s coastal zone (VDEQ, 2019c). The agencies involved in the CZMP include:

- VDEQ
- VDCR
- VMRC
- VDGIF
- VDH
- VDACS
- VDOF
- Virginia Department of Historic Resources (VDHR)
- Virginia Department of Mines, Minerals, and Energy (VDMME)
- VDOT
- Virginia Economic Development Partnership (VEDP)
- VIMS

The VDEQ Office of Environmental Impact Review coordinates the review of federal consistency determinations among these agencies. Federal consistency review is conducted concurrently with the review of NEPA documents.

Methodology

CZMP information is available online through the state's Department of Environmental Quality website (VDEQ, 2019c).

Existing Conditions

According to VDEQ, Virginia's Coastal Management Area encompasses the 29 counties, 17 cities, and 42 incorporated towns in "Tidewater Virginia," as defined in the Code of Virginia (§ 28.2-100). The study area is located in Fairfax County, which is entirely within the Coastal Management Area.

Environmental Consequences

No Build Alternative

Under the No Build Alternative, no project-related construction would occur, and therefore no changes to coastal resources would result. No federal consistency determination would be required.

Build Alternative

As a federal project located within the Virginia Coastal Management Area, the Build Alternative would be subject to consistency review under the Virginia CZMA. The information presented in this Natural Resources Technical Report demonstrates that the Build Alternative would be consistent with the enforceable policies of the Virginia CZM.

3.3 THREATENED AND ENDANGERED SPECIES

3.3.1 Anadromous Fish

Regulatory

Anadromous fish are born in freshwater, migrate to the ocean, and return to freshwater streams and rivers to spawn (NOAA, 2019b). Historical records indicate anadromous fish species such as herring and shad migrated through the fall zone into the upper reaches of all major drainages in Virginia (VDGIF, 2019c). While there is not a regulatory mandate to protect anadromous fish, VDGIF and VMRC, in combination with NOAA Fisheries, oversee anadromous fish in Virginia. NOAA Fisheries has jurisdiction over anadromous fish listed under the Endangered Species Act (ESA) through their Office of Protected Resources.

The Federal Magnuson-Steven Fisheries Conservation and Management Act of 1976, as amended, provides for the conservation and management of the nation's fishery resources through the preparation and implementation of fishery management plans. Federal agencies are required to consult with the National Marine Fisheries Society (NMFS) on proposed actions that may affect Essential Fish Habitat (EFH), which are the water and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (NOAA, 2018). The Fish and Wildlife Coordination Act, as amended in 1964, requires that all federal agencies consult with NOAA Fisheries, USFWS, and state wildlife agencies when proposed actions might result in modification of a natural stream or body of water. Federal agencies must consider the impacts that these projects would have on fish and wildlife development and provide for improvement of these resources in the study area.

Methodology

VDGIF is responsible for documenting confirmed and potential Anadromous Fish Use Areas and maintains a database with this information (VDGIF, 2019d). The location of confirmed and potential Anadromous Fish Use Areas, in relation to the study area, was determined in GIS using the VDGIF Wildlife

Environmental Review Map Service (WERMS) (VDGIF, 2018b) and data from NMFS was used to determine the presence or absence of EFH within the study area (NOAA, 2018).

Existing Conditions

According to the VDGIF VaFWIS report (see **Appendix B**) and WERMS GIS layers, the Potomac River is the only confirmed Anadromous Fish Use Area within the study area that supports species such as the Atlantic sturgeon (*Acipenser oxyrinchus*), striped bass (*Morone saxatilis*), yellow perch (*Perca flavescens*), and several shad and herring species (*Alosa* spp.). A review of data obtained from the NMFS indicates that EFH does not exist within or adjacent to the study area (NOAA, 2018) (see **Figure 3-16**).

Environmental Consequences

No Build Alternative

Under the No Build Alternative, no project-related construction would occur, and therefore no changes to anadromous fish populations or habitats would result.

Build Alternative

The proposed project would have no direct impacts to the Potomac River, and therefore no direct impact to anadromous fish populations or habitats.

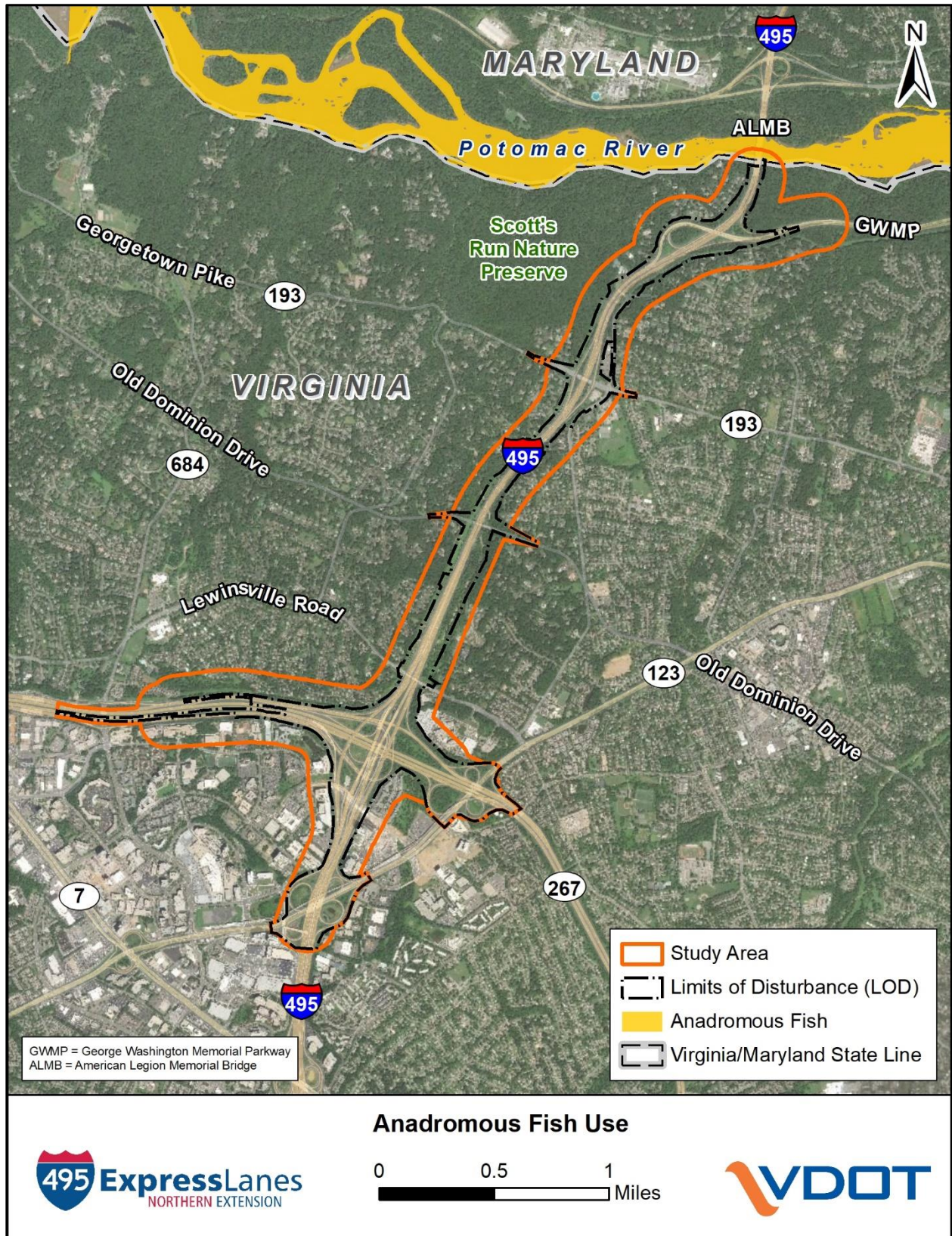


Figure 3-16. Anadromous Fish Waters

3.3.2 Protected Terrestrial Species

Regulatory

The ESA of 1973 and subsequent amendments and regulations define basic protections for federally-listed wildlife and plants that are considered threatened, endangered, or species of greatest conservation need. The law also affords protections to prescriptive habitat critical for protected species' survival, and applies to all federal, state, and privately-authorized projects or actions. USFWS and NMFS are responsible for listing, protecting, and managing federally-listed threatened and endangered species. Under Section 7 of the ESA, federal agencies are required to consult with USFWS and NMFS to ensure that their undertakings do not adversely affect listed species and designated critical habitats.

The Virginia Endangered Species Act of 1972 and the Endangered Plant and Insect Species Act of 1979 protect species that are listed as threatened or endangered at the state level. VDGIF and VDACS are responsible for administering and enforcing these regulations. In addition, a cooperative agreement with USFWS, signed in 1976, recognizes VDGIF as the designated state agency with regulatory and management authority over federally-listed animal species and provides for federal/state cooperation regarding the protection and management of those species (VDGIF, 2019a; Gagnon et al., 2010). VDACS holds authority to enforce regulations pertaining to plants and insects, and DNH comments on their behalf (VDACS, 2019).

Bald and Golden Eagle Protection Act

Although bald eagles (*Haliaeetus leucocephalus*) are no longer federally- or state-listed, this species is currently protected under the Bald and Golden Eagle Protection Act. The bald eagle typically forages in rivers or other large bodies of water, and nesting sites are commonly located in large forested areas adjacent to marshes, on farmland, or in seed tree cutover areas (USFWS, 2017b). Threats to the bald eagle include habitat destruction, electrocution, poisoning, wind farms, and pesticides. For projects that have blasting or other loud noise components, the buffer distance required around an Eagle nest is 2,640 feet, or up to 5,280 feet in open areas. For projects without blasting or other loud noise components, the buffer distance around an Eagle nest is 660 feet. If a project may disturb nesting bald eagles, an Eagle Act permit from USFWS may be necessary (USFWS, 2019a).

Migratory Bird Treaty Act

The Migratory Bird Treaty Act makes it illegal for anyone to harass, harm, pursue, kill, or collect any migratory bird, or the parts, nests, or eggs of a migratory bird, except under the terms of a valid permit issued pursuant to federal regulations. Migratory birds may be of concern within the study area at existing bridges along the roadway. Coordination with state and federal agencies would be required if one or more of the species listed in 50 CFR §10.13 are present during certain times of the year within the study area. The roadway bridges in the study area may provide nesting habitat for these species and other common birds, such as geese (*Anserini* spp.), swallows (*Hirundinidae* spp.), falcons (*Falco* spp.), owls (*Strigiformes* spp.), cormorants (*Phalacrocoracidae* spp.), and gulls (*Larinae* spp). The flat decks under roadway bridges, vertical structures, structural cavities, and pier footings provide locations for nest building or egg laying. The eggs and nests of these species are also protected under the Migratory Bird Treaty Act of 1918, and take is prohibited. The term take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct, without a federal permit.

Methodology

Information on documented occurrences of federally-listed and state-listed threatened and endangered species was obtained through searches of the USFWS Information for Planning and Consulting (IPaC), VDGIF VaFWIS, and VDCR-DNH online databases. Further comments were solicited from USFWS, VDGIF, and DCR regarding this project and potential effects on threatened and endangered species. Potential habitat acreages were produced in GIS using land cover shapefiles and aerial imagery. See below for more detailed information pertaining to methodologies for each protected species.

Bald Eagles

The Center for Conservation Biology (CCB) Virginia Eagle Nest Locator (CCB, 2019) was used to identify known bald eagle roosts and nests. The USFWS VA Bald Eagle Concentration Areas Mapper was also reviewed to identify any eagle concentration areas near the study area (USFWS, 2019e).

Migratory Bird Species

Migratory bird species that may occur or do occur within the study area were determined using the species list obtained from VDGIF VaFWIS. The Migratory Bird Treaty Act list of protected migratory species was also consulted during this investigation (USFWS, 2015).

Northern Long-Eared Bat

Both the VDGIF VaFWIS species list and the USFWS Information for Planning and Consultation (IPaC) tool were consulted for information regarding the northern long-eared bat (NLEB) in the study area (USFWS, 2019d). The VDGIF NLEB Winter Habitat and Roost Trees application was used to identify known NLEB hibernacula (VDGIF, 2019g).

During summer months, NLEB roost singly or in colonies underneath bark, in cavities, or in crevices of both live and dead trees. This bat seems opportunistic in selecting roosts, using tree species based on suitability to retain bark or provide cavities or crevices. It has also been found, rarely, roosting in structures like barns and sheds (Bat Conservation International, 2019). For the purposes of this study, all forested areas identified in the Virginia Land Cover Dataset were considered potential summer habitat.

Little Brown Bat & Tri-Colored Bat

The VDGIF VaFWIS species list and the VDGIF Little Brown Bat and Tri-Colored Bat Winter Habitat and Roosts Application were consulted to identify known little brown bat and tri-colored bat winter habitat and roosts (VDGIF, 2019f). Habitat for the little brown bat includes caves, buildings, rocks and trees, under bridges, and in mines and tunnels (VDGIF, 2019h). The tri-colored bat prefers edge habitats and are believed to roost in foliage or in high tree cavities and crevices (Bat Conservation International, 2019). For the purposes of this report, potential habitat for the little brown bat and tri-colored bat was identified as any forested land represented in the Virginia Land Cover Dataset that existed within the study area.

Rusty Patched Bumble Bee (RPBB)

The USFWS Official Project Review (USFWS, 2019c) guide as well as the USFWS RPBB Map (USFWS, 2019b) were consulted to identify historical ranges of the RPBB and zones where there is potential for the RPBB to be present. Available GIS layers from USFWS were used to evaluate proximity of high and low potential areas for the presence of the RPBB to the study area.

Wood Turtle

The VDGIF VaFWIS species list was consulted to identify confirmed observations of the wood turtle within the study area. The wood turtle lives along streams and terrestrial habitats adjacent to streams, including woodlands, fields, marshes, and bogs. This species is often associated with marginal edge habitats and ecotones. Wood turtles overwinter in the bottoms of streams where water flows throughout the season (NatureServe Explorer, 2019). Potential habitat for the wood turtle was determined using RPA shapefiles, and shapefiles of known wetlands and streams within the study area.

Existing Conditions

The information obtained from the review of the USFWS IPaC, VDGIF VaFWIS, and VDCR-DNH databases is summarized in **Table 3-17**. The table presents the species with confirmed occurrences within a 3-mile radius of the study area, along with each species' listed status and the source(s) of its listing.

Table 3-17. Threatened and Endangered Species Occurrences in Study Area

Species	Status	Source of Listing
Northern Long-Eared Bat (<i>Myotis septentrionalis</i>)	FT, ST	VaFWIS, USFWS IPaC
Rusty patched bumble bee (<i>Bombus affinis</i>) (historic)	FE	VDCR-DNH
Little Brown Bat (<i>Myotis lucifugus</i>)	SE	VaFWIS
Tri-Colored Bat (<i>Perimyotis subflavus</i>)	SE	VaFWIS
Wood Turtle (<i>Glyptemys insculpta</i>)	ST	VaFWIS, VDCR-DNH

Source: VDGIF, 2019b; USFWS, 2019d; VDCR, 2019g

FE = Federally Endangered; SE = State Endangered; FT = Federally Threatened; ST = State Threatened

VaFWIS = Virginia Fish and Wildlife Information Service; IPaC = Information for Planning and Consultation; VDCR-DNH = Virginia Department of Conservation Resources-Department of Natural Heritage

Potential habitat was verified in the study area following methodologies addressed above for all species contained in **Table 3-17**.

The search results from the USFWS IPaC database show no critical habitat within the study area (USFWS, 2019d). USFWS expressed no concerns regarding species identified within the study area during coordination with them in December 2018 nor December 2019. DCR identified the Potomac Gorge as a conservation site within the study area but did not identify any threatened or endangered species (see **Section 3.14.2**). VDGIF recommended performing an updated search of bald eagle nests using the Center for Conservation Biology (CCB) website, adhering to protocols for bat habitat assessment and protection, distributing standard awareness guidance for the state threatened wood turtle to all VDOT staff and contractors, and adhering to their standard guidelines for VDOT projects protective of state threatened wood turtles (see **Appendix B**).

Bald Eagle

Review of USFWS Virginia Field Office mapping (USFWS, 2019e) and the CCB Virginia Eagle Nest Locator database indicate that the study area is not within or adjacent to any bald eagle concentration areas

or bald eagle nest locations (CCB, 2019). The closest known bald eagle nest to the study area is located approximately 3.3 miles east of the study area (see **Appendix B**). As the study area does not intersect with a bald eagle concentration area and it is not anticipated that project-related activities would disturb nesting bald eagles, no Eagle Act Permit is required for this project.

Migratory Bird Species

After consulting the VDGIF VaFWIS species list it was determined that there are no confirmed occurrences of migratory bird species on the Migratory Bird Treaty Act list of protected migratory species within the study area.

Northern Long-Eared Bat

While no documented occurrences of NLEB were identified in the VDGIF VaFWIS report, the study area is within the range of the federally threatened NLEB. Per VDGIF and USFWS Virginia Field Office protocols, the VDGIF's application for NLEB winter habitat and roost trees was reviewed and results can be seen in **Appendix B** (VDGIF, 2019g). The study area is not within the vicinity of any known hibernacula or maternity roosts, with the nearest hibernaculum located 86.5 miles away (see **Figure 3-17**). However, suitable summer habitat for the NLEB is present throughout the study area (see **Figure 3-19**).

Table 3-18 details the total acreage of estimated NLEB summer habitat within the study area.

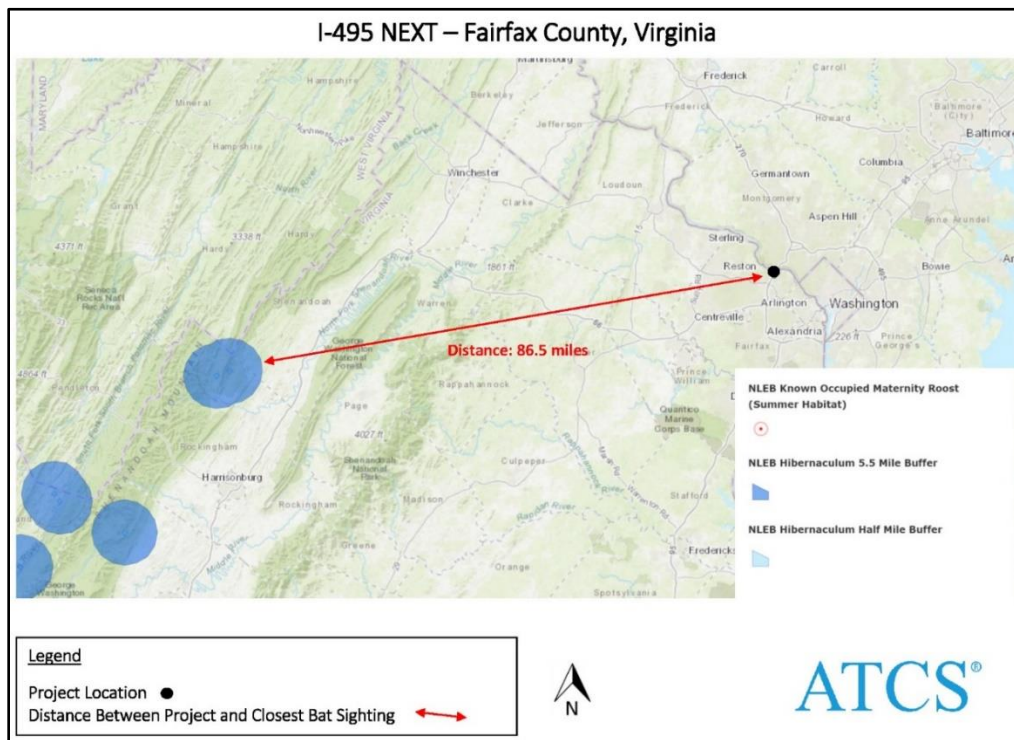


Figure 3-17. Northern Long-Eared Bat Hibernaculum Review

Little Brown Bat and Tri-Colored Bat

The VaFWIS report identified documented occurrences of the little brown bat and the tri-colored bat, both state-listed as endangered, within a two-mile radius of the study area (VDGIF, 2019b). Per VDGIF

protocols, the VDGIF Little Brown Bat and Tri-Colored Bat Winter Habitat and Roosts Application was reviewed (see **Appendix B**). The study area is not within the vicinity of any known hibernacula or maternity roosts, and therefore, per VDGIF protocols, no habitat assessment is required for these bat species, and incidental take of these species is not anticipated (VDGIF, 2019f).

Rusty Patched Bumble Bee

VDCR-DNH identified the federally-listed endangered RPBB as historically occurring within the study area (VDCR, 2019), and the USFWS RPBB Map did not identify the study area as being an area where the RPBB may be present. Fairfax County is considered to be part of the RPBB historic range, although no observations of RPBB have been documented since before 2000. USFWS expressed no concerns regarding this species during coordination with them in December 2018 or December 2019. High and low potential habitat areas for the RPBB can be seen in **Figure 3-18**.

Wood Turtle

According to the VDGIF VaFWIS the wood turtle has been documented within several streams within a 3-mile radius of the study area, including Turkey Run, Difficult Run, and Pimmit Run. Suitable habitat for this species within the study area includes riparian areas along the Potomac River, Dead Run, Turkey Run, and Scott Run, as depicted in **Figure 3-19**, and the estimated total acreage of this species' potential habitat in the study area is included in **Table 3-18**.

Figure 3-19 shows potential habitat for the northern long-eared bat, the little brown bat, the tri-colored bat, and the wood turtle, and **Figure 3-18** depicts the high and low potential areas for the RPBB located outside of the study area. Potential habitat for the bald eagle and migratory bird species are not shown because there are no confirmed observations of these species within the study area.

Table 3-18. Potential Habitat for Threatened and Endangered Species in Study Area

Species	Estimated Habitat Acreage
Northern Long-Eared Bat	400.5
Little Brown Bat	400.5
Tri-Colored Bat	400.5
Wood Turtle	178.3

Source: Field reconnaissance data from September 2019; VGIN, 2016

The bald eagle and migratory bird species are not included in this table because there are no confirmed observations of these species within the study area. The rusty patched bumble bee is not included because its high and low potential areas have been identified outside of the study area.

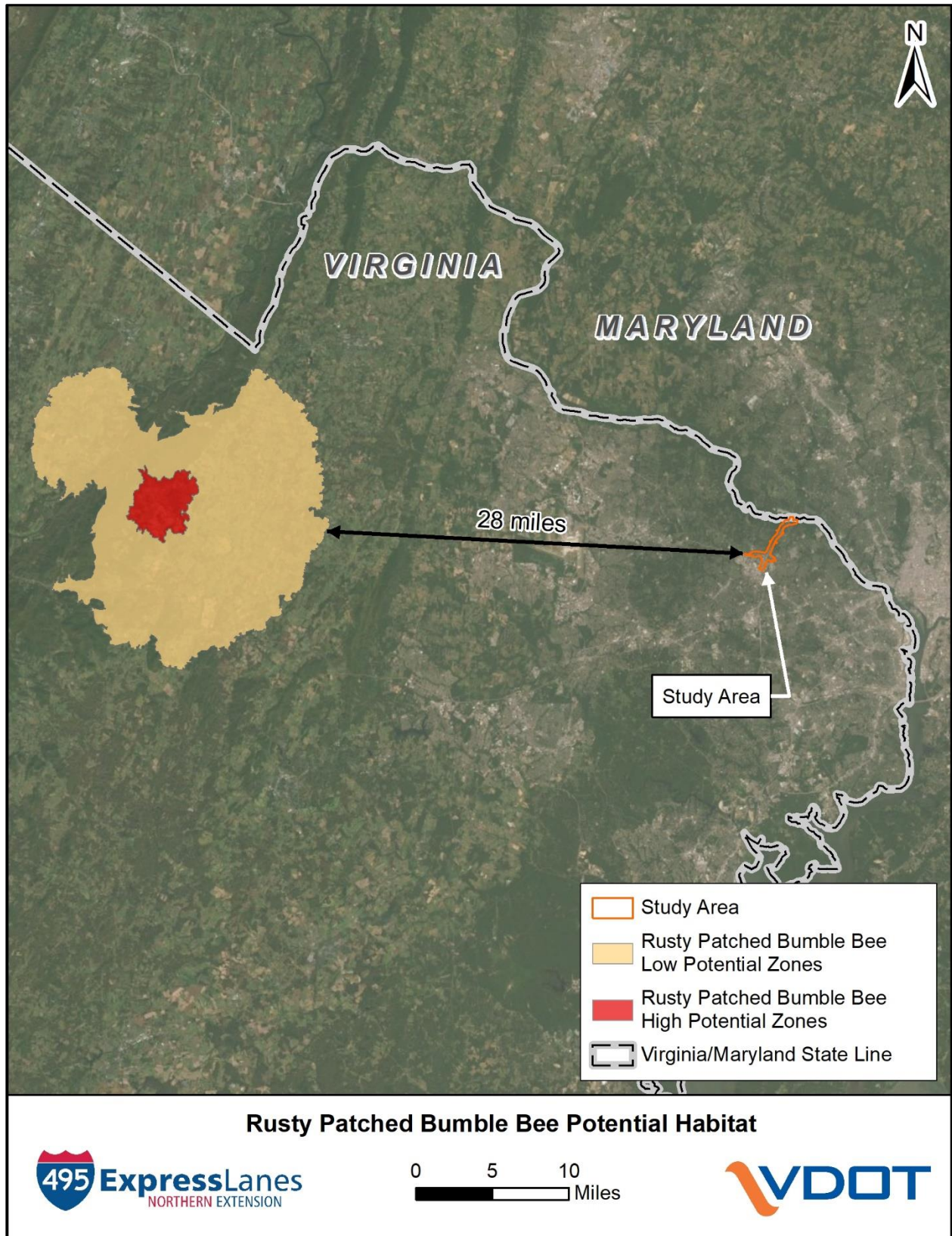


Figure 3-18 Proximity of Study Area to RPBB Low and High Potential Zones

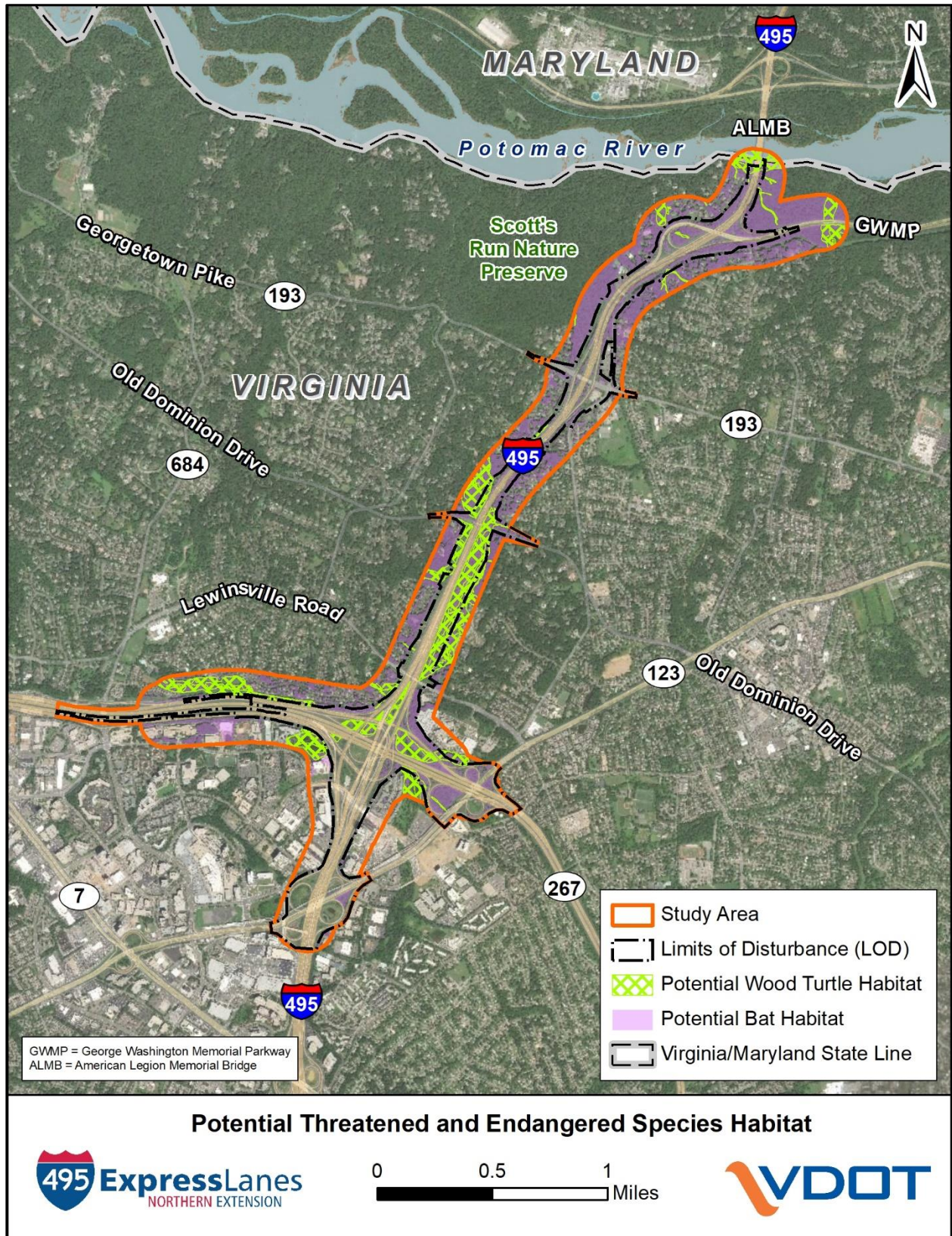


Figure 3-19. Potential Habitat for Threatened and Endangered Species

Environmental Consequences

No Build Alternative

Under the No Build Alternative, no project-related construction would occur, and therefore no changes to populations of threatened or endangered species, or their respective habitats, would result.

Build Alternative

The total impacts to threatened and endangered species habitat are shown in **Table 3-19**. Information regarding each species specifically and how they may be impacted by the Build Alternative is discussed below.

Bald Eagle—According to mapping obtained from the USFWS Virginia Field Office (USFWS, 2019e) and CCB Virginia Eagle Nest Locator (CCB, 2019), the study area is not within or adjacent to any bald eagle concentration areas, and there are no known bald eagle nests within the study area. Therefore, no impacts to bald eagles are anticipated. These databases would be reviewed again if and when a federal permit is requested for this project. If a bald eagle nest is identified at a later date, appropriate agency coordination would occur to determine if an Eagle Act Permit from the USFWS would be required.

Migratory Birds—There are no confirmed observations of migratory birds within the study area; therefore, there are no suspected impacts to these species. The Migratory Bird Treaty Act states that it is illegal to capture, kill or hurt any migratory bird, nest or egg. If a migratory bird is observed during construction in the study area, further coordination with USFWS may be required.

Northern Long-Eared Bat—The Build Alternative would result in the clearing of approximately 118 acres of forested areas that serve as suitable summer habitat for the federally threatened NLEB. The majority of tree clearing would occur within 300 feet of existing roadways, with the exception of the proposed relocation of Scott Run south of Old Dominion Drive. Forest clearing along the edge of the existing right-of-way would result in minimal reduction in forested cover and quality of forested habitat. Clearing of forested habitat within interchanges and smaller fragmented forest areas would result in the removal of sub-optimal habitat that has a low potential for roosting and generally does not provide suitable commuting and foraging corridors for the NLEB. No confirmed maternity roosts or hibernacula are located within a two-mile radius of the study area (VDGIF, 2019g), further limiting the potential effects on this species. Conservation and protection measures for the northern long-eared bat would be in accordance with the final 4(d) rule and the Programmatic Biological Assessment for Transportation Projects in the Range of the NLEB. Prior to construction, additional coordination with the USFWS Virginia Field Office regarding impacts to the NLEB would be required.

Little Brown Bat and Tri-Colored Bat—Tree clearing could impact potential summer habitat for the state-listed endangered little brown bat and tri-colored bat. Forest clearing along the edge of the existing right-of-way would result in minimal reduction in forested cover and quality of forested habitat. Clearing of forested habitat within interchanges and smaller fragmented forest areas would result in the removal of sub-optimal habitat that has a low potential for roosting and generally does not provide suitable commuting and foraging corridors for these species. No confirmed maternity roosts or hibernacula are located within a two-mile radius of the study area (VDGIF, 2019g). Therefore, incidental take of these species is not anticipated. Prior to construction, additional coordination would be undertaken with VDGIF to identify any necessary conservation measures to minimize impacts to these species.

Rusty Patched Bumble Bee—According to USFWS, areas within the Build Alternative are considered to be in the historic range of the RPBB. However, the study area is not designated as an area where this species may be present. If RPBBs are identified within the LOD at a later date, appropriate agency coordination would be required.

Wood Turtle—As discussed in **Section 3.1**, the Build Alternative would result in impacts to streams, floodplains, and RPAs that contain potential habitat for the wood turtle. The VDGIF VaFWIS identified confirmed observations of the wood turtle within a 2-mile radius of the study area, but no known observations within the study area. During coordination with VDGIF in February 2020, they recommended distributing standard awareness guidance for the state threatened wood turtle to all VDOT staff and contractors, and adhering to their standard guidelines for VDOT projects protective of wood turtles (see **Appendix B**).

To reduce potential impacts to threatened and endangered species and their respective habitats, efforts to minimize the construction footprint would be considered. Construction practices would avoid the removal of existing vegetation to the greatest extent possible and include the implementation of best management practices for erosion and sediment control, as well as stormwater management, to reduce potential impacts to adjacent habitats and properties. Practices such as the installation and use of silt fence, straw bales, diversion ditches, sediment traps and basins, culvert outlet protection, vegetative streambank stabilization, dewatering structures, temporary and permanent seeding, and flagging or fencing of areas not to be disturbed would minimize impacts to both terrestrial and aquatic species.

Table 3-19. Estimated Threatened and Endangered Species Impacts – Build Alternative

Species	Approximate Impacts (Acres)
Little Brown Bat	118
Tri-Colored Bat	118
Northern Long Eared Bat	118
Wood Turtle	70

Source: VGIN, 2016

The rusty patched bumble bee, the bald eagle and migratory birds are not included in this table because there are no confirmed observations of these species within the study area.

Additional Surveys—Due to the potential presence of threatened and endangered species where suitable habitat is present, presence/absence surveys may be required by the agencies. If the presence of any species is confirmed, the agencies may recommend a time-of-year restriction for activities within occupied habitat. These restrictions would be determined through the permitting process. A summary of current applicable time-of-year restrictions for the species currently listed as threatened or endangered is found in

Table 3-20. Time-of-Year Restrictions for Threatened and Endangered Present Species

Species	Time of Year Restrictions
Bald Eagles	Nest Sites: December 15 to July 15 Concentration Areas and Roost Sites: May 15 to August 31 (summer) and December 15 to March 15 (winter)
General migratory and resident songbirds	March 15 to August 14
Northern Long Eared Bat	April 15 to September 15 (active season) or June 1 to July 31 (pup season)
Little Brown Bat and Tri-Colored Bat	December 1 to April 30 (250-foot radius buffer zone) and September 1 to November 30 (0.25-mile radius)
Wood Turtle	Instream work: October 1 to March 31 Work within 900 feet of stream: April 1 to September 30

Source: VDGIF, 2016; VDGIF, 2018a

3.4 CONCLUSION

3.4.1 Summary of Existing Natural Resources and Environmental Consequences

See **Table 3-21** for a summary of the natural resources identified in this technical report and the anticipated environmental consequences associated with each resource under the Build Alternative.

Table 3-21. Summary of Existing Natural Resources and Environmental Consequences

Environmental Resource	Existing Resources Summary	Potential Environmental Consequences	
		No Build Alternative	Build Alternative
Impaired Waters	Dead Run (impaired macroinvertebrate community) and the Potomac River (excess nutrient and sediment inputs) are designated as impaired waters under Section 303(d) of the CWA.	No changes in water quality would result. Stormwater management features would not be improved or added where absent.	Potential impacts to Dead Run during construction include erosion, sedimentation, or accidental spills of hazardous materials from construction equipment. The Potomac River is not within the LOD and is not expected to be impacted.
Streams	A total of 49 streams were identified within the study area. Most of these are within VDOT right-of-way, are fragmented in nature and show signs of historic alteration, including ditching or straightening, as well as areas of rip-rap.	No project-related construction would occur, and therefore no changes to streams would result.	A total of 26 streams would be impacted, totaling 12,821 linear feet of impacted stream assuming no new bridging is implemented to avoid or minimize impacts to these streams. 65% of these impacts are within VDOT right-of-way.
Wetlands	A total of 42.4 acres of wetlands have been identified in the study area. These wetland boundaries were confirmed by the USACE in December of 2019 and a PJD was obtained January 15, 2020.	No project-related construction would occur, and therefore no changes to wetlands would result.	A total of 19.8 acres of wetlands would be impacted assuming of no bridging or alternative design methods are implemented. 37% of these impacts are within VDOT right-of-way. Potential roadway construction impacts include discharges of fill material.
Floodplains	Approximately 94.1 acres of 100-year floodplains associated with three waterways are located within the study area.	No changes to floodplains would result.	Approximately 60 acres of floodplains are located within the LOD. The project design would be consistent with federal policies and will not be a “significant encroachment;” therefore no increase in flood levels or probability of flooding are expected.

Environmental Resource	Existing Resources Summary	Potential Environmental Consequences	
		No Build Alternative	
Aquifers/Water Supply	No public ground water wells, surface water intakes, springs, reservoirs, or sole source aquifers were identified within the study area. The study area is not within a GWMA.	No changes to aquifers, groundwater, or public water sources would result.	Implementation of the Build Alternative is not expected to affect public water resources as it is not within a GWMA. Excavation associated with the project is not anticipated to encounter the groundwater table.
Submerged Aquatic Vegetation	There are no acres of SAV within or adjacent to the study area. The nearest SAV beds to the study area are approximately 4.6 miles southeast.	No changes to SAV beds would result.	The nearest identified SAV bed is in the Potomac River. As the Build Alternative does not intersect the Potomac River, no impacts to SAV are expected.
Wildlife and Wildlife Habitat	Available wildlife habitat accounts for approximately 641 acres of the study area, and approximately 35% of this habitat is within existing VDOT right-of-way and is therefore reserved for transportation purposes. Terrestrial habitat is fragmented and edge habitat is low-quality. A total of 68 species are likely to occur or are confirmed to occur within a 2-mile radius of the study area.	No changes to wildlife, existing land use, or habitat fragmentation levels would result. The barrier to wildlife passage created by the existing highway would remain unchanged. No elimination of existing wildlife passages is anticipated.	Approximately 233 acres of available wildlife habitat would be impacted, and 78% of this habitat is within existing right-of-way. Increasing the width of the roadway corridor would not likely increase habitat fragmentation as forested land would not be newly separated from contiguous forest. No elimination of existing wildlife passages is anticipated.
Invasive Species	Common invasive species were identified in the study area, primarily within disturbed areas.	The presence of invasive species would be unchanged.	The spread of invasive species would be minimized by following provisions in VDOT's <i>Road and Bridge Specifications</i> (VDOT, 2019b).
Topography and Soils	There are approximately 19 acres of farmland of statewide importance and 23 acres of prime farmland within the study area. Approximately 7% of the prime and 11% of the statewide important farmland soils identified in the study area occur within the existing right-of-way.	No changes to topography or soils, including prime and farmland, would result.	A total of 8.0 acres of protected farmland soils would be impacted, including 4.8 acres of prime farmland and 3.2 acres of farmland of statewide importance.

Environmental Resource	Existing Resources Summary	Potential Environmental Consequences	
		No Build Alternative	Build Alternative
Chesapeake Bay Protection Areas	There are approximately 152.6 acres of RPA lands within the study area.	No changes to RPAs or any associated resources would result.	76.1 acres of temporary and permanent impacts to RPAs would occur. The Build Alternative meets exemption conditions. Therefore, if the final design is optimized to limit encroachment into RPAs and upholds specific water quality protection criteria, no additional mitigation for RPA impacts is necessary.
Virginia Coastal Management Areas	The study area is located in Fairfax County, which is entirely within the Coastal Management Area.	Under the No Build Alternative, no project-related construction would occur, and therefore no changes to coastal resources would result. No federal consistency determination would be required.	As a federal project located within the Virginia Coastal Management Area, the Build Alternative would be subject to consistency review under the Virginia CZMA.
Anadromous Fish	The Potomac River is the only confirmed Anadromous Fish Use Area within the study area. Essential Fish Habitat does not exist within or adjacent to the study area.	No changes to anadromous fish populations or habitat would result.	The project would have no direct impacts to the Potomac River, and therefore no direct impact to anadromous fish populations or habitats.
Threatened, Endangered, and Special Status Species	The following species were identified to have confirmed or historic occurrences within a 3-mile radius of the study area: northern long-eared bat, rusty patched bumble bee (historic), little brown bat, tri-colored bat, and wood turtle.	No changes to populations of threatened or endangered species, or their respective habitats would result.	Tree clearing could impact potential suitable summer habitat for the three bat species, with the majority occurring along the edge of existing right-of-way resulting in minimal reduction in forested cover and quality of forested habitat. Streams and floodplains that contain potential habitat for the wood turtle would be impacted. Additional mitigation would be determined during permitting and design. The presence of these resources would not prevent FHWA from selecting the Build Alternative in its NEPA decision.

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