

**THREATENED AND ENDANGERED SPECIES  
TECHNICAL REPORT**

**ENVIRONMENTAL DOCUMENTATION FOR  
ROUTE 28 CORRIDOR**

**PREPARED FOR PRINCE WILLIAM COUNTY  
DEPARTMENT OF TRANSPORTATION**

**November 2018**

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## **1. INTRODUCTION**

### **1.1 PROJECT DESCRIPTION**

Parsons Transportation Group Inc. of Virginia, in coordination with the Prince William County Department of Transportation (PWC DOT) and Virginia Department of Transportation (VDOT), and in cooperation with the Federal Highway Administration (FHWA) as the lead federal agency, is preparing an Environmental Assessment (EA) to evaluate the potential social, economic, and environmental effects associated with proposed improvements in the Route 28 corridor between Godwin Drive in Prince William County and Compton Road in Fairfax County. The EA will evaluate three alternatives developed in the December 2017 Route 28 Corridor Feasibility Study. These alternatives, designated 2A, 2B, and 4, were the three highest ranked alternatives in the Feasibility Study based on criteria that included planning level costs, project benefits, and environmental and right of way impacts.

Alternative 2A would extend Godwin Drive north from the existing Godwin Drive/Sudley Road intersection, then turn east along the south side of Bull Run until joining existing Centreville Road. Centreville Road would be widened from this point north to tie into widening of Centreville Road planned by Fairfax County. Alternative 2B would follow the same alignment as Alternative 2A until reaching a point near Old Centreville Road, where it would turn northward and cross Bull Run at the existing crossing of Old Centreville Road, and tie into existing Centreville Road north of Bull Run where it would meet the Centreville Road widening planned by Fairfax County. Alternative 4, would widen existing Centreville Road on the existing alignment between Liberia Avenue and the Fairfax County/Prince William County Line.

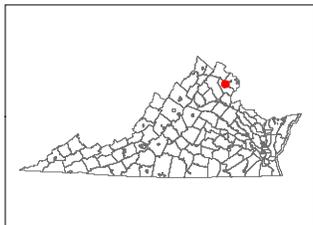
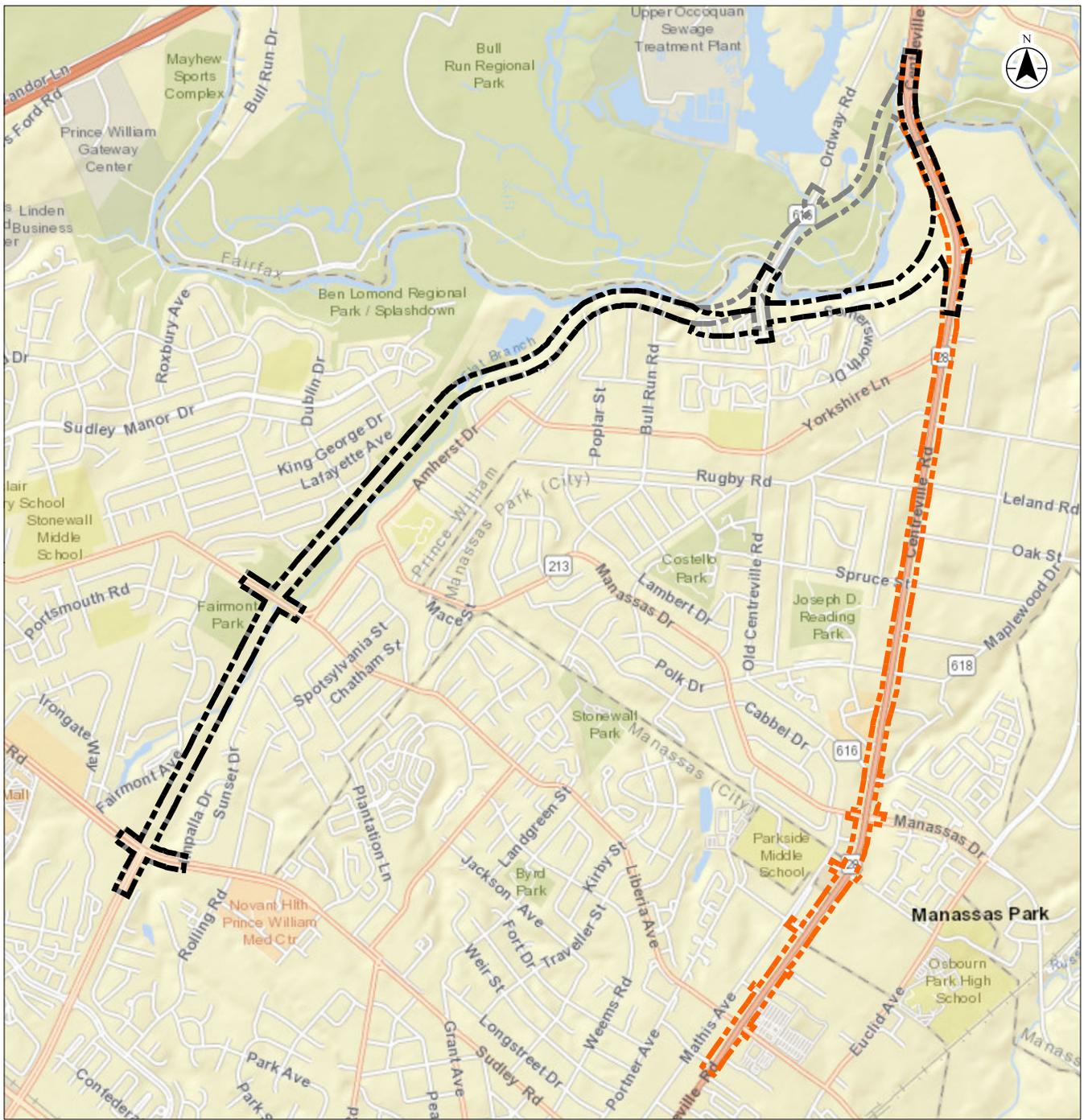
The purpose of this Technical Report is to identify the presence of habitat for threatened and endangered species within the three alternatives. Information in this report, described below, will support discussions presented in the environmental documentation.

- Section 1 provides an overview of the study and outlines the methods used to assess habitat for threatened and endangered species.
- Section 2 provides an overview of the regulatory context for the threatened and endangered species habitat assessment.
- Section 3 provides the results of the habitat assessment for each species.
- Section 4 assesses the potential impact of the project on the threatened and endangered species.

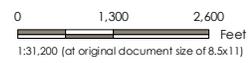
#### **1.1.1 Purpose and Need**

The purpose of the project is to reduce congestion and improve travel times and network reliability within a portion of the Route 28 corridor in Prince William County and the Cities of Manassas and Manassas Park. The south ends of the alternatives connect with existing roadways on which projected Year 2040 no-build traffic levels of service would be generally satisfactory. The north ends of the alternatives would connect with VA 28 widening planned by Fairfax County. Therefore, the alternatives have logical termini and independent utility. The Study Area for the environmental documentation is defined by a 250-foot-wide corridor encompassing the combined boundaries of Alternatives 2A, 2B and 4.

The Study Area for the proposed alternatives is shown on **Figure 1**.



-  Alternative 2A Limits
-  Alternative 2B Limits
-  Alternative 4 Limits



Project Location: 203401138  
 Fairfax, Prince William, and Manassas Counties and City of Manassas Park, Virginia  
 Prepared by YOP on 2018-08-02  
 Technical Review by IPS on 2018-08-02  
 Independent Review by SW on 2018-08-02

Client/Project: Parsons Transportation Group, Inc.  
 Environmental Documentation for Route 28 Corridor

Figure No. 1  
 Title

**Study Area Location Map**

- Notes**
1. Coordinate System: NAD 1983 StatePlane Virginia North RPS 4501 Feet
  2. Project limits provided by Parsons Transportation Group, Inc.
  3. Orthomogery © ESRI

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## 1.2 METHODOLOGY

Threatened and endangered species that may occur within the three alternatives were identified based on review of agency databases, Geographic Information System (GIS) databases and mapping, and field reconnaissance of the three alternatives. The following federal and state agencies and/or databases were consulted for information regarding federal and state listed species that might occur within the alternatives:

- United States Fish & Wildlife Service (USFWS)
- Virginia Department of Conservation and Recreation - Division of Natural Heritage (VDCR-DNH)
- Virginia Department of Game and Inland Fisheries (VDGIF)

The results of the database searches are included in **Appendix A**.

A summary of species identified from the database searches and agency coordination are summarized in **Table 3-1**. To evaluate the potential impact of the project to these species, areas of potential habitat for the listed species were assessed and documented. Field notes were recorded and representative photographs were taken for both suitable and unsuitable habitat. Habitat boundaries were mapped in the field to accurately depict the extent of potential suitable habitat for individual species. For the purposes of this study, all forested habitat was generally considered suitable for the northern long-eared bat (*Myotis septentrionalis*, NLEB). Areas depicted as forested on the most recent available aerials were confirmed in the field and any areas that were found to be non-forested were excluded as habitat.

The quantity of potential habitat for threatened and endangered species within the alternatives was determined by performing a GIS overlay of the areas identified through the onsite and offsite assessments as having suitable habitat.

More specific information regarding data gathering sources and approach are presented within the discussion of each resource in Section 3, and references are listed in Section 6.

## 2. REGULATORY CONTEXT

Endangered species are defined as those species in danger of extinction throughout all or a significant portion of their range. Threatened species are defined as those species that are likely to become endangered within the foreseeable future throughout all or a significant portion of their range. The USFWS regulates and protects federally listed threatened and endangered species under the Endangered Species Act (ESA) of 1973 (16 USC 1531-1544) with the primary goal of conserving and recovering listed species.

Compliance with the ESA is required for projects that have the potential to impact federally listed threatened or endangered species or their habitat. The ESA, with few exceptions, prohibits activities affecting threatened and endangered species unless authorized by a permit. Anyone who is conducting otherwise-lawful activities that will result in the “incidental take” of a listed wildlife species needs a permit. If a project is federally funded or authorized or carried out by a federal agency, as this project is, the permitting process is conducted through Section 7 consultation. Section 7 of the ESA requires federal agencies to consult with USFWS to ensure that any federal action authorized, funded, or carried out is not likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or modification of critical habitat, unless granted an exemption for such action (USFWS, 2017).

A December 2012 Memorandum of Understanding between VDOT and FHWA titled “Compliance with Section 7 of the Endangered Species Act in Relation to the National Environmental Policy Act Process”

documents the timing of compliance with Section 7 of the ESA. In some situations, where a project may adversely affect a threatened or endangered species, the design and construction details needed to consult with USFWS and complete a biological assessment may not be available until further along in the project development process. On January 14, 2016, the USFWS published a final 4(d) Rule that defines prohibitions for purposeful and incidental take of NLEB (USFWS, 2016). A December 2016 range-wide programmatic agreement between USFWS and FHWA, Federal Railroad Administration (FRA), and Federal Transit Administration (FTA) for the Indiana bat (*Myotis sodalis*) and NLEB can be utilized for these species in lieu of formal Section 7 consultation, if the project adheres to the scope and criteria of the range-wide Biological Assessment (BA) and the Intra-Service Programmatic Biological Opinion (BO) revised on February 5, 2018. The Intra-Service Programmatic BO on the final 4(d) Rule for the NLEB may be used for projects only affecting the NLEB that do not include the Indiana bat (USFWS, 2018). This section documents Section 7 efforts that have been accomplished to date, and the following commitments for future activities are being made:

- Section 7 consultation will be completed before any irreversible or irretrievable commitments of resources are made expressly for construction activities; and
- Additional steps to complete the Section 7 process prior to construction will be taken. These steps would likely include:
  - Update the database searches to list current species;
  - Perform Informal consultation with the USFWS to determine if the species or critical habitat is potentially present;
  - Conduct habitat assessments for any additional species identified during updated database review and agency coordination and update habitat assessments for the species that have been previously conducted;
  - Determine what effect the project may have on the species or its habitat;
  - Conduct presence/absence surveys if necessary;
  - Submit project information to USFWS to determine whether the project adheres to the scope and criteria of the range-wide BA for the Indiana and northern long-eared bat, and the Intra-Service Programmatic BO on the Final(d) Rule for the NLEB, if necessary; and
  - Prepare the BA for any species to support Section 7 formal consultation, if necessary.

In addition to the federal oversight, threatened and endangered species are also regulated at the state level. The VDGIF has adopted the federal list as well as a state list of endangered and threatened species, with the primary focus of managing Virginia's wildlife (Virginia Code §29.1-563-570). In addition, the Virginia Department of Agriculture and Consumer Services (VDACS) regulates threatened and endangered plant and insect species (Virginia Code §3.2-1000-1011). Through a Memorandum of Agreement established between the Virginia Department of Conservation and Recreation (VDCR) and VDACS, VDCR represents VDACS in comments regarding potential impacts to state-listed threatened and endangered plants and insect species. The legal state status is determined by VDGIF (all animals except insects) and VDACS (plants and insects).

### **3. AFFECTED ENVIRONMENT**

State and federally listed species that are reported to occur or potentially occur within the vicinity of the Study Area were identified through the USFWS's Information for Planning and Consultation database (IPaC), VDGIF's Virginia Fish and Wildlife Information Service database (VaFWIS), VDGIF bat winter habitat and roost tree applications, the Center for Conservation Biology (CCB) Eagle Nest Locator and the VDCR-DNH database/project review.

**Table 3-1** provides a summary of the species that were identified as potentially occurring within the Study Area.

**Table 3-1: Threatened and Endangered Species Documented within Vicinity of the Study Area**

Species	Status	Source of Listing
Dwarf Wedgemussel ( <i>Alasmidonta heterodon</i> )	FE/SE	IPaC, VaFWIS
Harperella ( <i>Ptilimnium nodosum</i> )	FE/SE	IPaC
Northern Long-eared Bat ( <i>Myotis septentrionalis</i> )	FT/ST	IPaC, VaFWIS
Brook Floater ( <i>Alasmidonta varicosa</i> )	SE	VaFWIS
Wood Turtle ( <i>Glyptemys insculpta</i> )	ST	VaFWIS

Source and notes: FE = Federally Endangered. FT = Federally Threatened. SE = State Endangered. ST = State Threatened. IPaC = USFWS Information for Planning and Consultation, July 2018. VaFWIS = Virginia Fish and Wildlife Information Service, July 2018.

The following sections provide a brief summary of the natural history and distribution of the species listed in **Table 3-1**. This information was utilized as a general framework for the habitat evaluation to determine the presence of habitat, affected environment, and environmental consequences of the proposed activities within the Study Area. Additionally, a discussion is included for those species that were determined to have potentially suitable habitat within the Study Area. No critical habitat has been designated by USFWS within the Study Area. The database search results did not indicate the presence of the state endangered little brown bat (*Myotis lucifugus*) or tri-colored bat (*Perimyotis subflavus*). However, per VDGIF protocols, the VDGIF bat winter habitat and roost tree application was reviewed. The alternatives are not within the vicinity of known hibernacula or maternity roosts and no habitat assessment was required for the little brown bat or the tri-colored bat within the alternatives, per VDGIF protocols. One bald eagle nest is identified in the CCB database to the west/northwest of the Study Area but neither the primary or secondary eagle nest buffers for the nest are in close proximity to the Study Area, therefore no further evaluation was conducted for this species.

### 3.1 FEDERALLY LISTED ENDANGERED (FE) SPECIES INFORMATION

**Dwarf Wedgemussel** (*Alasmidonta heterodon*) –The dwarf wedgemussel is relatively small and inhabits creeks and rivers with a slow to moderate current and a sand, gravel, or muddy bottom (USFWS, 2011). The reproductive cycle of the dwarf wedgemussel is similar to that of other native mussels. Males release sperm into the water and the eggs are fertilized (usually in early fall) when the females take in the sperm through their siphons during feeding and respiration (USFWS, 2011; VDGIF, 2018a). The fertilized eggs are retained in the gills of the females until the larvae (glochidia) are fully developed. Once the glochidia are fully developed, they are released (usually by mid-spring) into the water and must attach to the gills or fins of appropriate fish species, which include the tessellated darter (*Etheostoma olmstedi*), Johnny darter (*Etheostoma nigrum*), and mottled sculpin (*Cottus bairdi*) (USFWS, 2011; USFWS, 2015). Poor water quality and loss of suitable habitat conditions have resulted in the decline and loss of dwarf wedgemussel populations and continue to threaten remaining populations (USFWS, 2011). Toxic effects from industrial, domestic and agricultural pollution are the primary threats to the dwarf wedgemussels’ survival (USFWS, 2015). In addition, short life spans (maximum age 12 years), low fecundity, high degree of host specificity, limited dispersal ability of its primary host, and low population densities, coupled with the threats facing this species, likely all contribute to the endangered status of the dwarf wedgemussel (USFWS, 2015). It was believed to have been extirpated from the state by 1989 but was rediscovered in Aquia Creek and in the upper Nottoway River in 1990 (VDGIF, 2018a).

**Harperella** (*Ptilimnium nodosum*) – Harperella is a small member of the carrot family. The riverine form of the plant is generally perennial or biennial (USFWS, 1990). Broad clusters of small white flowers bloom mostly in July and August (NatureServe, 2018). The plant can occur on rocky/gravelly shoals or cracks in bedrock outcrops in clear, swift moving streams. Harperella occurs in a narrow range of depths and is intolerant of deep water or conditions that are too dry. The plants readily tolerate periodic and moderate flooding, which also serves as a method of seed dispersal. Threats to the species include alterations of natural hydrologic regimes, siltation and erosion, and water quality reductions. This species was found in 2002 within Aquia Creek, just upstream from the Fall Line and northwest of Garrisonville, within fissures of a bedrock outcrop in the channel shelf (SABS, 2004).

### **3.2 FEDERALLY LISTED THREATENED (FT) SPECIES INFORMATION**

**Northern Long-eared Bat** (*Myotis septentrionalis*) The northern long-eared bat (NLEB) is a medium-sized bat in the genus *Myotis* that can be found throughout the eastern and midwestern U.S. and southern Canada. The NLEB uses a wide variety of forested habitats for roosting, foraging and traveling, and may also utilize some adjacent and interspersed non-forested habitat such as emergent wetlands and edges of fields. This species has also been found roosting in structures like barns, sheds and bridges (particularly when suitable tree roosts are unavailable). The bats emerge at dusk to forage in upland and lowland woodlots and tree-lined corridors, feeding on insects, which they catch while in flight using echolocation. This species also feeds by gleaning insects from vegetation and water surfaces (VDGIF, 2018a).

Roosting habitat includes forested areas with live trees and/or snags with a diameter at breast height (dbh) of at least 3 inches with exfoliating bark, cracks, crevices and/or other cavities. Trees are considered suitable if they meet those requirements and are located within 1,000 feet of the nearest suitable roost tree, woodlot, or wooded fencerow. Maternity habitat is defined as suitable summer habitat that is used by juveniles and reproductive females. The summer maternity season in Virginia is April 1 through September 30. Winter habitat includes underground caves and cave-like structures such as abandoned or active mines and railroad tunnels. The NLEB migrate between their winter hibernacula and summer habitat, typically between mid-March and mid-May, and mid-August and mid-October. They are considered a short-distance migrant (typically 40 - 50 miles), although their known migratory distances can vary greatly between 5 and 168 miles (VDGIF, 2018a).

The primary threat to NLEB is white-nose syndrome (WNS) which is caused by the fungus *Pseudogymnoascus destructans*. WNS is responsible for unprecedented mortality in some hibernating insectivorous bats in the northeastern U.S., including dramatic and rapid population declines in NLEB populations up to 99 percent from pre-WNS levels. Impacts to hibernacula, summer habitat, and mortality during migration are also threats to the species (USFWS, 2016).

### **3.3 STATE LISTED ENDANGERED (SE) SPECIES INFORMATION**

**Brook Floater** (*Alasmidonta varicosa*) This species is a small mussel usually found in fast-flowing, clean water in substrates that contain relatively firm rubble, gravel, and sand substrates swept free from siltation. They are buried in the substrate in shallow riffle and shoal areas. This species requires a fish host and balanced environment to complete its life cycle. Potential hosts identified for the brook floater include: blacknose dace (*Rhinichthys atratulus*), longnose dace (*Rhinichthys cataractae*), golden shiner (*Notemigonus crysoleucas*), pumpkinseed (*Lepomis gibbosus*), slimy sculpin (*Cottus cognatus*), yellow perch (*Perca flavescens*), and margined madtom (*Noturus insignis*) (Bogan 2002; Nedeau et al., 2000). This species is most likely extirpated from Virginia as it has not been seen live for over 15 years now and is the rarest mussel in the Atlantic Slope in Virginia (VDGIF, 2018a). The primary locations for the species is/was the Shenandoah River watershed and the Potomac River watershed. Broad Run in the Potomac used to harbor

a population, but heavy urban development has impacted this stream. The only live specimens that have been found recently include those in the mainstem Potomac River.

### **3.4 STATE LISTED THREATENED (ST) SPECIES INFORMATION**

**Wood Turtle** (*Glyptemys insculpta*) The wood turtle's original North American range extended from Nova Scotia to eastern Minnesota, south to Iowa, east to Virginia, and north to New York. While this turtle has no federal designation, it is currently considered threatened or endangered in much of its range. In Virginia, this species has a restricted range extending from Arlington and northern Fairfax Counties westward through Loudoun and Clarke Counties to Fredrick, Warren and Shenandoah Counties (VDGIF, 2018a).

The wood turtle is a moderate-sized terrestrial and aquatic species with a flattened and sculptured carapace and scutes with a pyramid of irregular growth layers and annuli (Virginia Herpetological Society, 2018). The turtle has a brown carapace and red, orange, or yellow pigment on the lower sides of limbs. Juvenile wood turtles are gray to brown, have a keelless carapace, and lack the pigment on their head and legs that is characteristic of adults.

The wood turtle is found primarily in and near clear brooks and perennial streams in deciduous woodlands but is also found in woodland bogs and marshy fields (Ernst and McBreen, 1991). The wood turtle is primarily terrestrial during the summer months and aquatic during the cooler months and hibernation (VDGIF, 2018a). Wood turtles typically overwinter on the bottom of creeks or streams, under banks overhanging creeks, or in muskrat burrows. In Virginia, the terrestrial phase occurs from April through November, but some aquatic movements occur in other months (Ernst and McBreen, 1991). Wood turtles are diurnal and when not basking or foraging, spend much of the day concealed in or under vegetation. The wood turtle is an omnivorous species (VDGIF, 2018a). In Virginia, mating behavior occurs year-round with the greatest frequency of observations occurring shortly after wood turtles return to the streams in the fall (VDGIF, 2018a). The nesting season extends from late May to early July with the greatest frequency of observed nesting in early June. The eggs are deposited in a cavity in the ground dug by the female, then covered and left to be incubated by the sun's heat. Nests are most often excavated on sandy-gravel banks near the stream, but wood turtles are known to nest in fields, along roadsides, in gravel pits, and manure piles.

The main threats to the wood turtle include urbanization and siltation of streams. Urbanization includes increases of impervious surfaces, nonpoint source pollution runoff, an increase in predators (i.e. raccoons, opossums, etc.), and vehicular mortality (VDGIF, 2018a).

### **3.5 HABITAT ASSESSMENT RESULTS**

Based upon an understanding of the life histories discussed above, and a result of the offsite and field analyses performed, potential habitat was verified within the Study Area for all listed species found in **Table 3-1**.

No harperella habitat was observed within Alternative 4. Potential habitats are shown on the Threatened and Endangered Species Habitat Map in **Appendix B**, excluding the NLEB, as detailed in the Methodology Section 1.2. Representative photographs of threatened and endangered species habitat are included in **Appendix C**.

The following sections describe the results of the habitat assessment for terrestrial and aquatic species and the conditions of the potential habitat present within the Study Area.

**Northern Long-eared Bat**

Suitable foraging and summer roosting habitat for NLEB is present within the Study Area for all three alternatives. For the purposes of this study, all forested areas were generally considered potential summer roosting habitat. Acreages were quantified based upon coverage on aerial photography and reconciled with observations during the field assessment. The total acreage of estimated NLEB summer roosting habitat is shown in **Table 3-2**. Scattered trees within commercial development, mostly along Route 28, do not provide suitable roosting habitat for NLEB due to human activity, noise and lights. Forested areas within commercial development with connections to larger blocks of forest were considered suitable habitat, although the use of these areas within the Study Area is unlikely due to the previously listed factors. The majority of commercial development is located within Alternative 4 along Route 28. Smaller fragmented areas of forest and individual trees associated with residential development may provide suitable roosting habitat, but in general would be considered suboptimal. Large areas of intact mature forest provide high quality roosting habitat within Alternatives 2A and 2B. Aquatic resources provide sources of water for the bats and habitat for insects used as forage. Forested areas, easements, road edges, and waterways can provide corridors for movement between habitat areas. These areas may also provide suitable day and night roost for bats. Fragmented communities surrounded by development are generally less suitable for use by the bats. Trees of 3" dbh or greater with suitable sized cavities may provide suitable habitat for maternity roosts. Bridges over wetlands or aquatic areas with sufficient prey are frequently utilized as night roosts for foraging or can be utilized as day roosts. Based upon observations made during the field assessment, it appears that bats may currently utilize or may have previously utilized the Route 28 bridge crossing of Bull Run for roosting. No signs of bats were observed on other bridges within the alternatives, but a bridge assessment would be required to make a definitive determination. Representative photos of suitable habitat areas are included in **Appendix C**.

**Table 3-2: Terrestrial Threatened and Endangered Species Habitat within Study Area**

Species	Acreage of Terrestrial Habitat		
	Alternative 2A	Alternative 2B	Alternative 4
Northern Long-eared Bat	55.94	64.96	7.60

**Mussels**

Potential habitat for mussels was found in several perennial streams within the Study Area for all three alternatives, as depicted on the Threatened and Endangered Species Habitat Map (**Appendix B**). These streams include Flat Branch, Bull Run and one unnamed perennial tributary to Bull Run. For the purposes of this study, the range of favorable habitat conditions preferred by the dwarf wedgemussel and brook floater was considered in the habitat evaluation and designation of streams as potential habitat. Intermittent and ephemeral stream channels were categorized as unsuitable habitat and were not evaluated. Suitable habitat was characterized by perennial streams that were relatively stable, with low levels of sediment accumulation, and displayed no signs of recent disturbance. Substrates varied between a mix of gravel, cobble, and sand. Stable point bars were present in some locations. No visible pollutants were observed within stream reaches designated as suitable habitat. The total linear feet of suitable mussel habitat within the three alternatives are summarized in **Table 3-3**. Habitat within Alternative 4 is limited to the location of the Route 28 crossing of Bull Run. The extent of habitat within Alternatives 2A and 2B are similar, with the exception of a large section of an unnamed perennial tributary to Bull Run that is only located in Alternative 2B. Dense populations of Chinese mystery snails (*Cipangopaludina chinensis*) and Asiatic clams (*Corbicula*

*fluminea*) were observed within the tributary, which could provide competition or other impacts to native mussel species. Several unidentified mussel shells were observed at this location.

Unsuitable streams were characterized by a combination of heavy sediment accumulation and embeddedness, rip-rap, unstable channel structure, and visible pollutants. Evidence of frequent flooding and impacts from roadside drainage was also visible in unsuitable habitat. Man-made alterations such as rip-rap and piping of stream channels through culverts were present in some unsuitable habitat areas.

Although streams within the Study Area display suitable habitat characteristics, it is less likely that any of the mussel species are present where road crossings occur due to historic disturbance, altered hydrologic conditions, and reduced habitat quality within the current right of way. Representative photographs of suitable and unsuitable mussel habitat are included in **Appendix C**.

### **Harperella**

Potential habitat for harperella is present within Alternatives 2A and 2B, but is not present within Alternative 4, as depicted on the Threatened and Endangered Species Habitat Map (**Appendix B**). Suitable habitat characteristics include stable point bars, bedrock outcrops, and rocky and gravelly shoals with moderate to swift flow. Frequent flooding appears to occur within Flat Branch which reduces the overall quality of the habitat within this area. The total linear feet of suitable harperella habitat within the Study Area is summarized in **Table 3-3**. The extent of habitat within Alternatives 2A and 2B are similar, with the exception of a large section of an unnamed perennial tributary to Bull Run that is only located in Alternative 2B.

Unsuitable habitat is characterized by unstable and deeply incised stream channels that lack rocky/ gravelly shoals, stable benches, or bedrock outcrops. Hydrologic regimes are typically significantly altered and evidence of frequent flooding is evident in unsuitable habitat areas. Habitat areas at the Old Centreville Road and Route 28 crossing of Bull Run were unsuitable due to rip-rap, vertical clay banks and bare clay shores, and a lack of stable benches. Representative photographs of suitable and unsuitable harperella habitat are included in **Appendix C**.

### **Wood Turtle**

Potential aquatic wood turtle was found within the Study Area for all three alternatives, as depicted on the Threatened and Endangered Species Habitat Map (**Appendix B**). These habitat areas are located within Flat Branch, Bull Run and one unnamed perennial tributary to Bull Run, within the same locations as the suitable mussel habitat. Floodplain access was present at points within each area of suitable habitat, either within the Study Area or upstream/downstream. Stable undercut banks, overhanging vegetation, and woody debris within pools provide suitable structure within the streams. Sediment accumulation within suitable habitat was moderate to low with most accumulation located at road crossing locations. Riparian forested buffers provide suitable summer habitat for wood turtles. The riparian area associated with Flat Branch is characterized by a narrow, forested corridor between existing development and along an existing easement. These areas do provide suitable foraging areas and corridors for wood turtles, even within areas of the stream with unsuitable aquatic habitat. Although the stream does have suitable habitat characteristics for the wood turtle it would be considered suboptimal habitat compared with that associated with Bull Run. It is more likely that the wood turtle would use Flat Branch as a corridor for foraging and summer habitat rather than winter habitat. Riparian corridors associated with Bull Run are generally composed of large intact forested areas with associated intermittent stream channels and wetlands, with some encroachment from development generally from the south. The unnamed perennial tributary to Bull Run, located only within Alternative 2B, is paralleled by a narrow, forested buffer to the west adjacent to Ordway Road with a large contiguous area of mature forest to the east.

Unsuitable streams were characterized by a combination of heavy sediment accumulation and embeddedness, rip-rap, lack of suitable instream structure/cover and unsuitable hydrologic regimes. Evidence of frequent flooding and impacts from roadside draining including erosion and channel incision were also visible in unsuitable habitat. Man-made alterations such as rip-rap and piping of stream channels through culverts were present in some unsuitable habitat areas. Representative photographs of suitable and unsuitable habitat are included in **Appendix C**.

**Table 3-3: Aquatic Threatened and Endangered Species Habitat within Study Area**

Species	Acreage and Linear Feet of Aquatic Habitat		
	Alternative 2A	Alternative 2B	Alternative 4
Dwarf Wedgemussel	1.45 Acres (1,337 l.f.)	2.25 Acres (2,587 l.f.)	0.52 Acres (252 l.f.)
Harperella	0.81 Acres (1,074 l.f.)	1.15 Acres (2,062 l.f.)	0.0 Acres (0.0 l.f.)
Brook Floater	1.45 Acres (1,337 l.f.)	2.25 Acres (2,587 l.f.)	0.52 Acres (252 l.f.)
Wood Turtle	1.45 Acres (1,337 l.f.)	2.25 Acres (2,587 l.f.)	0.52 Acres (252 l.f.)

#### **4. ENVIRONMENTAL CONSEQUENCES**

The Alternatives 2A, 2B and 4 could potentially impact threatened and endangered species and their habitat. Alternatives 2A and 2B have habitat for all five (5) species while Alternative 4 has habitat for all species except harperella. Alternative 2B has the greatest potential to affect threatened and endangered species habitat with potential impacts to all species being the highest of the alternatives. Alternative 2A has the next highest acreages/linear feet of potential impacts to threatened and endangered species habitat. Potential impacts for Alternative 4 are much lower than the other two alternatives since a large portion of this alternative occurs along developed portions of Route 28. **Table 4-1** summarizes preliminary conclusions regarding potential effects on these species based on presence or absence of suitable habitat. Further discussion on the potential impacts of the alternatives to each species are provided in the following paragraphs.

**Table 4-1: Preliminary Species Conclusion Table**

Species / Resource Name	Conclusion	ESA Section 7 / Eagle Act Determination	Notes / Documentation
Northern Long Eared Bat ( <i>Myotis septentrionalis</i> )  FT/ST	Suitable habitat present	May affect	Relying upon the findings of the 1/5/2016 Programmatic Biological Opinion for Final 4(d) Rule on the Northern Long-Eared Bat and Activities Excepted from Take Prohibitions to fulfill our project-specific section 7 responsibilities. Adherence to TOYR or absence confirmed during surveys may result in "Not likely to adversely affect" or "No effect".
Dwarf Wedgemussel ( <i>Alasmidonta heterodon</i> )  FE/SE	Suitable habitat present	May affect	Avoidance of direct impacts to habitat, strict adherence to E&S controls, adherence to appropriate TOYR or absence confirmed during surveys may result in "Not likely to adversely affect" or "No effect".
Harperella ( <i>Ptilimnium nodosum</i> )  FE/SE	Suitable habitat present in Alt 2A and 2B. No habitat in Alt 4.	May affect for Alt 2A and 2B. No effect for Alt 4.	Avoidance of direct impacts to habitat, strict adherence to E&S controls, or absence confirmed in surveys may result in "No effect".
Bald Eagle ( <i>Myotis septentrionalis</i> )	No nests present within project vicinity	No Eagle Act Permit required	
Critical Habitat	No critical habitat present	No effect	No critical habitat present
<b>State Listed Species</b>			
Brook floater ( <i>Alasmidonta varicosa</i> )  SE	Suitable habitat present	n/a	Avoidance of direct impacts to habitat, strict adherence to E&S controls, adherence to appropriate TOYR or absence confirmed during surveys will reduce the potential for the species to be affected by the project.
Wood turtle ( <i>Glyptemys insulpta</i> )  ST	Suitable habitat present	n/a	Avoidance of direct impacts to habitat, strict adherence to E&S controls, adherence to appropriate TOYR or absence confirmed during surveys will reduce the potential for the species to be affected by the project.

Notes: FE = Federally Endangered. FT = Federally Threatened. SE = State Endangered. ST = State Threatened

Summer roosting habitat has been confirmed for NLEB within Study Area for all three alternatives. Clearing of forested habitat along Route 28 would generally result in the removal of low quality edge habitat and fragmented forested areas within the alternatives, most of which occurs within Alternative 4, and should generally not disrupt any existing corridors for bats. Few NLEB roosts would be expected in close proximity to existing transportation corridors (i.e. 100') and harm to NLEB would be unlikely in these areas (USFWS, 2018). Clearing along Route 28 at the crossing of Bull Run proposed within the Study Area could result in an increased gap in the forested riparian corridor at this location but should not reduce the potential use of the area for foraging and commuting, or the potential use of the bridge for roosting. Potential forested clearing and construction along Flat Branch in Alternatives 2A and 2B could impact potential roosts, corridors and foraging by bats in the area. The reduction of forest could result in more narrow, linear forested communities and provide a barrier between forested areas along Flat Branch and west of the existing easement. Highways can act as a barrier to bats due to the reluctance of some species to cross open ground and avoid lit areas (i.e. road and vehicle lights) and they have been shown to make major detours to avoid roads and appropriate crossing points during foraging (Voight et al, 2016). The proposed connection between Old Centreville Road and Route 28 would result in clearing within the interior of an area of mature forest east of Bull Run for Alternative 2A and west of Bull Run for Alternative 2B. Construction and clearing within these areas would result in the fragmentation of suitable habitat, loss of reduction of potential roosting habitat and barriers to bat movements between previously accessible habitat areas. Potential impacts within Alternative 2B to the unnamed tributary could also result in the loss of a potential corridor to Bull Run. No confirmed maternity roosts or hibernacula are located within a two-mile radius of the alternatives (VDGIF, 2018b), which should reduce the potential effects of the alternatives on NLEB. The effects of the proposed alternatives on food and aquatic resources within suitable foraging habitat can be minimized utilizing proper erosion and sediment control measures such as flagging or fencing to demarcate areas not to be disturbed, silt fence and straw bale installation, dust control, and vegetative streambank stabilization. Limiting forested clearing within the riparian corridors of Bull Run and Flat Branch can reduce the potential impact on corridors utilized by NLEB to access habitat areas outside of the alternatives.

The quality of suitable harperella habitat within Flat Branch and Bull Run should not be significantly impacted if the areas remain bridged and hydrologic conditions do not change as a result of construction activities. Potential impacts to the tributary to Bull Run within Alternative 2B could directly impact habitat or render it unsuitable due to possible alterations in hydrology, solar exposure, or water quality. Indirect or cumulative impacts within and downstream of the alternatives can be minimized or avoided by adhering to strict erosion and sediment control measures. In addition, efforts should be made to prevent colonization of invasive species within the vicinity of suitable habitat as a result of construction and stabilization activities.

Suitable aquatic mussel and wood turtle habitat within Bull Run should not be substantially impacted if the areas remain bridged and hydrologic conditions and water quality do not change as a result of construction activities. Avoidance of direct impacts within the stream channel, the use of proper stormwater management and stabilization of areas disturbed during construction will reduce potential impacts to the species and their habitat. Potential impacts to the tributary to Bull Run within Alternative 2B could disrupt corridors for the wood turtle to access habitat upstream and downstream of the alternative. Considerations to maintaining this corridor could be made during design as disruption of the corridor could lead to an increase in potential mortality for wood turtles to cross the road to reach previously accessible habitat. Potential impacts to Flat Branch and associated riparian buffers in Alternatives 2A and 2B may also disrupt potential wood turtle corridors and could be given the same consideration as previously noted. Potential impacts to forested areas and wetlands may result in a loss of foraging habitat and may result in an increase in narrow linear forested habitat. Linear fragmented forest patches such as those that occur within existing ROW and adjacent to or within areas of development are more frequently colonized by predators (Fleming

and Patterson, 2013) such as the raccoon (*Procyon lotor lotor*), striped skunk (*Mephitis mephitis*) and red fox (*Vulpes vulpes*).

The presence of federal and state threatened or endangered species within the project would require coordination with various federal and state agencies. The agencies may require that presence/absence surveys be conducted. Through the coordination with these agencies, potential impacts to species and their habitats can be evaluated and minimized by implementing various practices as part of the design.

If presence of any species is confirmed, the agencies may recommend a time of year restriction (TOYR) for activities within occupied habitat and these restrictions would be determined through the permitting process. A summary of current applicable TOYRs for specific species currently listed as threatened or endangered is provided in **Table 4-2**.

**Table 4-2: Threatened and Endangered Species Time of Year Restrictions**

Species	Time of Year Restrictions
Northern Long-eared Bat <sup>1</sup>	15 Apr – 15 Sept for tree removal activities.
Dwarf Wedgemussel <sup>2</sup>	15 March – 31 May; 15 August – 15 October
Brook Floater <sup>2</sup>	15 April – 15 June; 15 August – 30 Sept
Wood Turtle	01 Oct – 31 March for instream work; 01 Apr – 30 Sept for work within 900' of stream

*Source and notes: 1. TOYR for avoidance of incidental take in summer roosting habitat. USFWS IPaC Online Project Review Step 7b - Northern Long-eared bats in Virginia. 2. VDGIF TOYR Restrictions Table (7/31/17).*

Efforts to avoid and or minimize direct instream impacts and any downstream indirect or cumulative impacts can be made by adhering to strict erosion and sediment control and performing all instream construction activities behind cofferdams. To reduce potential impacts to terrestrial threatened and endangered species and their habitat, 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 silt fence and 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.

## **5. ACRONYM AND ABBREVIATION LIST**

The following is the list of acronyms and abbreviations.

BA	Biological Assessment
BO	Biological Opinion
CCB	Center for Conservation Biology
DBH	Diameter at Breast Height
E&S	Erosion and Sediment
FHWA	US Federal Highway Administration
FRA	US Federal Railroad Administration
FTA	US Federal Transit Administration
GIS	Geographic Information Systems
IPaC	USFWS Information for Planning and Consultation
NEPA	National Environmental Policy Act
NLEB	Northern Long-eared Bat
PWC DOT	Prince William County Department of Transportation
TOYR	Time of Year Restriction
USFWS	US Fish and Wildlife Service
VaFWIS	Virginia Fish and Wildlife Information System
VDACS	Virginia Department of Agriculture and Consumer Services
VDCR	Virginia Department of Conservation and Recreation
VDCR-DNH	Virginia Department of Conservation and Recreation - Division of Natural Heritage
VDGIF	Virginia Department of Game and Inland Fisheries
VDOT	Virginia Department of Transportation
WNS	White-nose Syndrome

## 6. REFERENCES

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**APPENDIX A:**  
**DATABASE RESULTS**



## United States Department of the Interior



FISH AND WILDLIFE SERVICE  
Virginia Ecological Services Field Office  
6669 Short Lane  
Gloucester, VA 23061-4410  
Phone: (804) 693-6694 Fax: (804) 693-9032  
<http://www.fws.gov/northeast/virginiafield/>

In Reply Refer To:

July 23, 2018

Consultation Code: 05E2VA00-2018-SLI-4560

Event Code: 05E2VA00-2018-E-10415

Project Name: Route 28 Alternative 2A

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered

species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.), and projects affecting these species may require development of an eagle conservation plan ([http://www.fws.gov/windenergy/eagle\\_guidance.html](http://www.fws.gov/windenergy/eagle_guidance.html)). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
  - USFWS National Wildlife Refuges and Fish Hatcheries
-

# Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Virginia Ecological Services Field Office  
6669 Short Lane  
Gloucester, VA 23061-4410  
(804) 693-6694

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## Project Summary

Consultation Code: 05E2VA00-2018-SLI-4560

Event Code: 05E2VA00-2018-E-10415

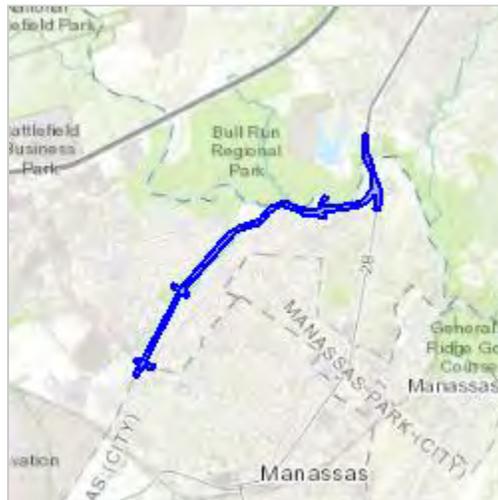
Project Name: Route 28

Project Type: TRANSPORTATION

Project Description: Rebuild of Route 28 with alternate options

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/38.787842230110456N77.48099003715583W>



Counties: Fairfax, VA | Manassas, VA | Prince William, VA

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## Endangered Species Act Species

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries<sup>1</sup>, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

- 
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

### Mammals

NAME	STATUS
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/9045">https://ecos.fws.gov/ecp/species/9045</a>	Threatened

### Clams

NAME	STATUS
Dwarf Wedgemussel <i>Alasmidonta heterodon</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/784">https://ecos.fws.gov/ecp/species/784</a>	Endangered

### Flowering Plants

NAME	STATUS
Harperella <i>Ptilimnium nodosum</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/3739">https://ecos.fws.gov/ecp/species/3739</a>	Endangered

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## Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

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# USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

REFUGE INFORMATION WAS NOT AVAILABLE WHEN THIS SPECIES LIST WAS GENERATED.  
PLEASE CONTACT THE FIELD OFFICE FOR FURTHER INFORMATION.

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## United States Department of the Interior



FISH AND WILDLIFE SERVICE  
Virginia Ecological Services Field Office  
6669 Short Lane  
Gloucester, VA 23061-4410  
Phone: (804) 693-6694 Fax: (804) 693-9032  
<http://www.fws.gov/northeast/virginiafield/>

In Reply Refer To:

July 24, 2018

Consultation Code: 05E2VA00-2018-SLI-4568

Event Code: 05E2VA00-2018-E-10435

Project Name: Route 28 Alternative B

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered

species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.), and projects affecting these species may require development of an eagle conservation plan ([http://www.fws.gov/windenergy/eagle\\_guidance.html](http://www.fws.gov/windenergy/eagle_guidance.html)). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
  - USFWS National Wildlife Refuges and Fish Hatcheries
-

# Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Virginia Ecological Services Field Office  
6669 Short Lane  
Gloucester, VA 23061-4410  
(804) 693-6694

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## Project Summary

Consultation Code: 05E2VA00-2018-SLI-4568

Event Code: 05E2VA00-2018-E-10435

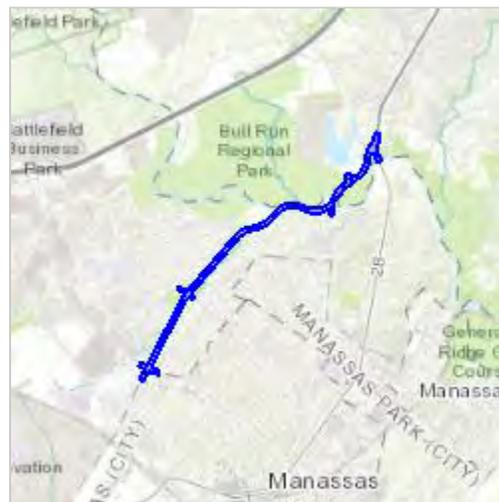
Project Name: Route 28 alternative B

Project Type: TRANSPORTATION

Project Description: Alternative B

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/38.787854040779955N77.48097323731471W>



Counties: Fairfax, VA | Manassas, VA | Prince William, VA

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## Endangered Species Act Species

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries<sup>1</sup>, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

- 
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

### Mammals

NAME	STATUS
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### Clams

NAME	STATUS
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NAME	STATUS
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---

## Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

---

# USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

---



## United States Department of the Interior



FISH AND WILDLIFE SERVICE  
Virginia Ecological Services Field Office  
6669 Short Lane  
Gloucester, VA 23061-4410  
Phone: (804) 693-6694 Fax: (804) 693-9032  
<http://www.fws.gov/northeast/virginiafield/>

In Reply Refer To:

July 24, 2018

Consultation Code: 05E2VA00-2018-SLI-4569

Event Code: 05E2VA00-2018-E-10437

Project Name: Route 28 Alternative 4

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered

species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.), and projects affecting these species may require development of an eagle conservation plan ([http://www.fws.gov/windenergy/eagle\\_guidance.html](http://www.fws.gov/windenergy/eagle_guidance.html)). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
  - USFWS National Wildlife Refuges and Fish Hatcheries
-

# Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Virginia Ecological Services Field Office  
6669 Short Lane  
Gloucester, VA 23061-4410  
(804) 693-6694

## Project Summary

Consultation Code: 05E2VA00-2018-SLI-4569

Event Code: 05E2VA00-2018-E-10437

Project Name: Route 28 Alternative 4

Project Type: TRANSPORTATION

Project Description: Alternative 4

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/38.78352395713327N77.44972804264972W>



Counties: Fairfax, VA | Manassas, VA | Manassas Park, VA | Prince William, VA

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## Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries<sup>1</sup>, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

- 
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

### Mammals

NAME	STATUS
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/9045">https://ecos.fws.gov/ecp/species/9045</a>	Threatened

### Flowering Plants

NAME	STATUS
Harperella <i>Ptilimnium nodosum</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/3739">https://ecos.fws.gov/ecp/species/3739</a>	Endangered

### Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

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# USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

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**VaFWIS Search Report** Compiled on 7/24/2018, 11:55:47 AM[Help](#)

Observations reported or potential habitat occurs within a **4 mile radius around point 38.7922566 -77.4518779**

in **059 Fairfax County, 153 Prince William County, 683 Manassas City, 685 Manassas Park City, VA**

[View Map of Site Location](#)

731 Known or Likely Species ordered by Status Concern for Conservation  
(displaying first 32) (32 species with Status\* or Tier I\*\* or Tier II\*\*)

<a href="#">BOVA Code</a>	<a href="#">Status*</a>	<a href="#">Tier**</a>	<a href="#">Common Name</a>	<a href="#">Scientific Name</a>
010032	FESE	Ib	<a href="#">Sturgeon, Atlantic</a>	Acipenser oxyrinchus
050022	FTST	Ia	<a href="#">Bat, northern long-eared</a>	Myotis septentrionalis
060029	FT	IIa	<a href="#">Lance, yellow</a>	Elliptio lanceolata
050020	SE	Ia	<a href="#">Bat, little brown</a>	Myotis lucifugus
050027	SE	Ia	<a href="#">Bat, tri-colored</a>	Perimyotis subflavus
060006	SE	Ib	<a href="#">Floater, brook</a>	Alasmidonta varicosa
030062	ST	Ia	<a href="#">Turtle, wood</a>	Glyptemys insculpta
040096	ST	Ia	<a href="#">Falcon, peregrine</a>	Falco peregrinus
040293	ST	Ia	<a href="#">Shrike, loggerhead</a>	Lanius ludovicianus
040379	ST	Ia	<a href="#">Sparrow, Henslow's</a>	Ammodramus henslowii
100155	ST	Ia	<a href="#">Skipper, Appalachian grizzled</a>	Pyrgus wyandot
040292	ST		<a href="#">Shrike, migrant loggerhead</a>	Lanius ludovicianus migrans
030063	CC	IIIa	<a href="#">Turtle, spotted</a>	Clemmys guttata
030012	CC	IVa	<a href="#">Rattlesnake, timber</a>	Crotalus horridus
010077		Ia	<a href="#">Shiner, bridle</a>	Notropis bifrenatus
040040		Ia	<a href="#">Ibis, glossy</a>	Plegadis falcinellus
040306		Ia	<a href="#">Warbler, golden-winged</a>	Vermivora chrysoptera
100248		Ia	<a href="#">Fritillary, regal</a>	Speyeria idalia idalia
040213		Ic	<a href="#">Owl, northern saw-whet</a>	Aegolius acadicus
040052		IIa	<a href="#">Duck, American black</a>	Anas rubripes
040033		IIa	<a href="#">Egret, snowy</a>	Egretta thula
040029		IIa	<a href="#">Heron, little blue</a>	Egretta caerulea caerulea
040036		IIa	<a href="#">Night-heron, yellow-crowned</a>	Nyctanassa violacea violacea
040181		IIa	<a href="#">Tern, common</a>	Sterna hirundo
040320		IIa	<a href="#">Warbler, cerulean</a>	Setophaga cerulea
040140		IIa	<a href="#">Woodcock, American</a>	Scolopax minor
060071		IIa	<a href="#">Lampmussel, yellow</a>	Lampsilis cariosa
040203		IIb	<a href="#">Cuckoo, black-billed</a>	Coccyzus erythrophthalmus
040105		IIb	<a href="#">Rail, king</a>	Rallus elegans

040304		IIC	<a href="#">Warbler, Swainson's</a>	Limnothlypis swainsonii
100154		IIC	<a href="#">Butterfly, Persius duskywing</a>	Erynnis persius persius
100166		IIC	<a href="#">Skipper, Dotted</a>	Hesperia attalus slossonae

To view **All 731 species** [View 731](#)

\*FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FP=Federal Proposed; FC=Federal Candidate; CC=Collection Concern

\*\*I=VA Wildlife Action Plan - Tier I - Critical Conservation Need; II=VA Wildlife Action Plan - Tier II - Very High Conservation Need;

III=VA Wildlife Action Plan - Tier III - High Conservation Need;

IV=VA Wildlife Action Plan - Tier IV - Moderate Conservation Need

Virginia Wildlife Action Plan Conservation Opportunity Ranking:

a - On the ground management strategies/actions exist and can be feasibly implemented.;

b - On the ground actions or research needs have been identified but cannot feasibly be implemented at this time.;

c - No on the ground actions or research needs have been identified or all identified conservation opportunities have been exhausted.

## Anadromous Fish Use Streams

N/A

## Impediments to Fish Passage ( 3 records )

[View Map of All Fish Impediments](#)

ID	Name	River	View Map
1165	<a href="#">NORTH TWIN LAKE DAM</a>	MOORE CREEK	<a href="#">Yes</a>
1164	<a href="#">SOUTH TWIN LAKE DAM</a>	MOORE CREEK	<a href="#">Yes</a>
1175	<a href="#">UPPER OCCOQUAN DAM</a>	TR-BULL RUN	<a href="#">Yes</a>

## Threatened and Endangered Waters

N/A

## Managed Trout Streams

N/A

## Bald Eagle Concentration Areas and Roosts

N/A

## Bald Eagle Nests

N/A

## Habitat Predicted for Aquatic WAP Tier I & II Species ( 12 Reaches )

[View Map Combined Reaches from Below of Habitat Predicted for WAP Tier I & II Aquatic Species](#)

Stream Name	Tier Species						View Map
	Highest TE*	BOVA Code, Status*, Tier**, Common & Scientific Name					
Bull Run (20700102)	SE	030062	ST	Ia	<a href="#">Turtle, wood</a>	Glyptemys insculpta	<a href="#">Yes</a>
Bull Run (20700102)	SE	030062	ST	Ia	<a href="#">Turtle, wood</a>	Glyptemys insculpta	<a href="#">Yes</a>
		060006	SE	Ib	<a href="#">Floater, brook</a>	Alasmidonta varicosa	
Bull Run (20700102)	SE	060006	SE	Ib	<a href="#">Floater, brook</a>	Alasmidonta varicosa	<a href="#">Yes</a>
Castle Creek (20700102)	ST	060006	SE	Ib	<a href="#">Floater, brook</a>	Alasmidonta varicosa	<a href="#">Yes</a>
Castle Creek (20700102)	ST	030062	ST	Ia	<a href="#">Turtle, wood</a>	Glyptemys insculpta	<a href="#">Yes</a>
Cub Run (20700102)	ST	030062	ST	Ia	<a href="#">Turtle, wood</a>	Glyptemys insculpta	<a href="#">Yes</a>
Flat Branch (20700102)	SE	030062	ST	Ia	<a href="#">Turtle, wood</a>	Glyptemys insculpta	<a href="#">Yes</a>
Flat Branch (20700102)	SE	060006	SE	Ib	<a href="#">Floater, brook</a>	Alasmidonta varicosa	<a href="#">Yes</a>
Holkums Branch (20700102)	ST	060006	SE	Ib	<a href="#">Floater, brook</a>	Alasmidonta varicosa	<a href="#">Yes</a>
Johnny Moore Creek (20700102)	ST	030062	ST	Ia	<a href="#">Turtle, wood</a>	Glyptemys insculpta	<a href="#">Yes</a>
Popes Head Creek (20700102)	ST	030062	ST	Ia	<a href="#">Turtle, wood</a>	Glyptemys insculpta	<a href="#">Yes</a>
tributary (20700102)	ST	030062	ST	Ia	<a href="#">Turtle, wood</a>	Glyptemys insculpta	<a href="#">Yes</a>
tributary (20700102)	SE	030062	ST	Ia	<a href="#">Turtle, wood</a>	Glyptemys insculpta	<a href="#">Yes</a>
tributary (20700102)	ST	060006	SE	Ib	<a href="#">Floater, brook</a>	Alasmidonta varicosa	<a href="#">Yes</a>
tributary (20700102)	ST	030062	ST	Ia	<a href="#">Turtle, wood</a>	Glyptemys insculpta	<a href="#">Yes</a>
Youngs Branch (20700102)	SE	030062	ST	Ia	<a href="#">Turtle, wood</a>	Glyptemys insculpta	<a href="#">Yes</a>

**Habitat Predicted for Terrestrial WAP Tier I & II Species**

N/A

**Virginia Breeding Bird Atlas Blocks** ( 10 records )[View Map of All Query Results](#)  
[Virginia Breeding Bird Atlas Blocks](#)

BBA ID	Atlas Quadrangle Block Name	Breeding Bird Atlas Species			View Map
		Different Species	Highest TE*	Highest Tier**	
50194	<a href="#">Gainesville, CE</a>	38		III	<a href="#">Yes</a>
50192	<a href="#">Gainesville, NE</a>	1			<a href="#">Yes</a>
50196	<a href="#">Gainesville, SE</a>	74		III	<a href="#">Yes</a>
51182	<a href="#">Independent Hill, NE</a>	76		III	<a href="#">Yes</a>
51181	<a href="#">Independent Hill, NW</a>	1			<a href="#">Yes</a>
51194	<a href="#">Manassas, CE</a>	1			<a href="#">Yes</a>
51193	<a href="#">Manassas, CW</a>	76		II	<a href="#">Yes</a>
51192	<a href="#">Manassas, NE</a>	68		II	<a href="#">Yes</a>
51196	<a href="#">Manassas, SE</a>	15		II	<a href="#">Yes</a>
51195	<a href="#">Manassas, SW</a>	1			<a href="#">Yes</a>

**Public Holdings:** ( 1 names )

Name	Agency	Level
Manassas National Battlefield Park	National Park Service	Federal

**Summary of BOVA Species Associated with Cities and Counties of the Commonwealth of Virginia:**

FIPS Code	City and County Name	Different Species	Highest TE	Highest Tier
059	<a href="#">Fairfax</a>	559	FESE	I
153	<a href="#">Prince William</a>	483	FESE	I
683	<a href="#">Manassas City</a>	372	FTSE	I
685	<a href="#">Manassas Park City</a>	371	FTSE	I

**USGS 7.5' Quadrangles:**

Gainesville  
Independent Hill  
Manassas

**USGS NRCS Watersheds in Virginia:**

N/A

**USGS National 6th Order Watersheds Summary of Wildlife Action Plan Tier I, II, III, and IV Species:**

<b>HU6 Code</b>	<b>USGS 6th Order Hydrologic Unit</b>	<b>Different Species</b>	<b>Highest TE</b>	<b>Highest Tier</b>
PL34	<a href="#">Broad Run-Rocky Branch</a>	59	FTSE	I
PL41	<a href="#">Occoquan River-Occoquan Reservoir-Lake Jackson</a>	56		I
PL44	<a href="#">Middle Bull Run</a>	72	FTSE	I
PL45	<a href="#">Cub Run</a>	70	FTST	I
PL46	<a href="#">Lower Bull Run</a>	69	ST	I

Compiled on 7/24/2018, 11:55:47 AM V916916.0 report=V searchType= R dist= 6436 poi= 38.7922566 -77.4518779

### Fish Impediments

38,47,30.8 -77,27,43.0  
is the Search Point

38,48,34.0 -77,31,02.7

[Refresh Browser Page](#)

Map Click



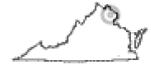
Map Scale



Screen Size



[Help](#)



### Show Position Rings

Yes  No  
1 mile and 1/4 mile at the Search Point

### Show Search Area

Yes  No  
3 Search distance miles radius

Search Point is at map center

### Base Map [Choices](#)

Topography

### Map Overlay [Choices](#)

Current List: Position, Search, Impediments

### Map Overlay Legend

#### Anadromous Fish Reach

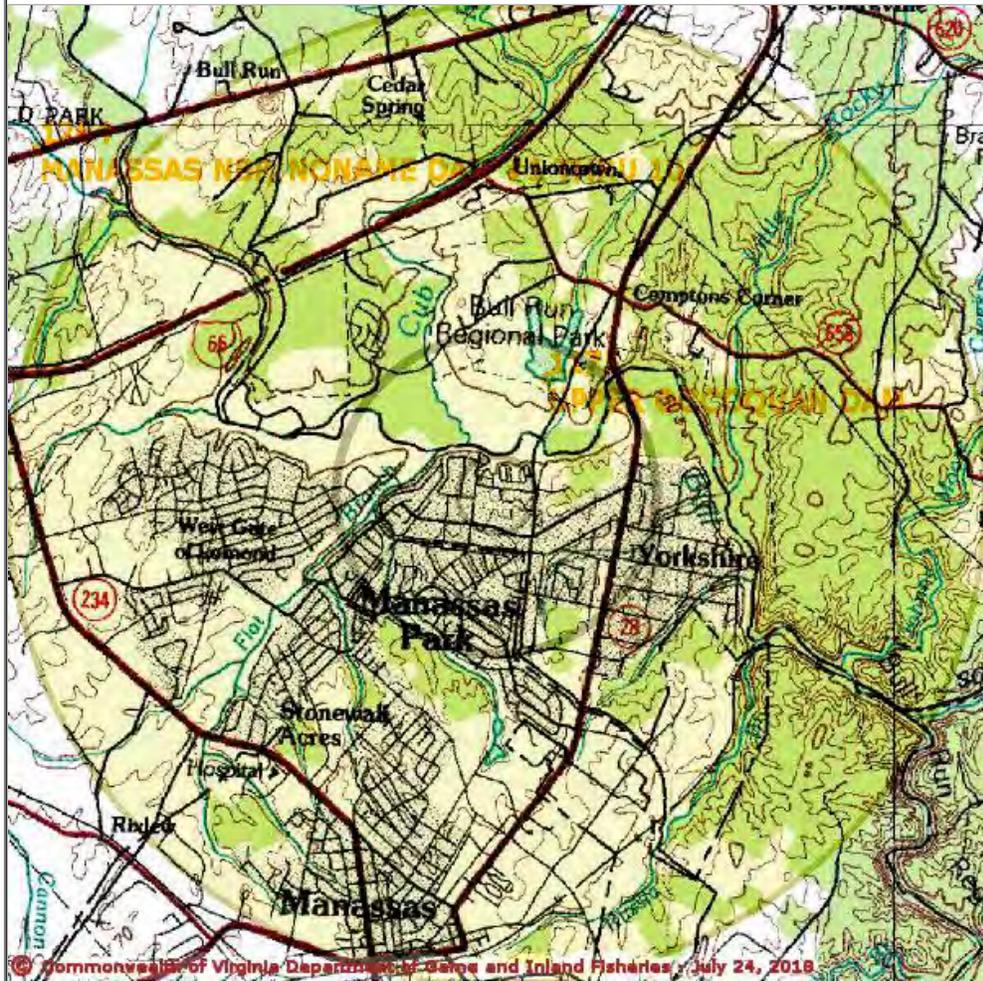
Confirmed

Potential

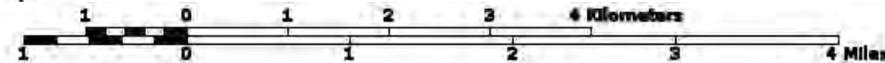
Impediment

Position Rings  
1 mile and 1/4 mile at the Search Point

3 mile radius Search Area



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Point of Search 38,47,30.8 -77,27,43.0

Map Location 38,47,30.8 -77,27,43.0

Select **Coordinate System**:  Degrees,Minutes,Seconds Latitude - Longitude

Decimal Degrees Latitude - Longitude

Meters UTM NAD83 East North Zone

Meters UTM NAD27 East North Zone

Base Map source: USGS 1:100,000 topographic maps (see [Microsoft terraserver-usa.com](http://Microsoft terraserver-usa.com) for details)

Map projection is UTM Zone 18 NAD 1983 with left 281381 and top 4301362. Pixel size is 16 meters . Coordinates displayed are Degrees, Minutes, Seconds North and West. Map is currently displayed as 600 columns by 600 rows for a total of 360000 pixels. The map display represents 9600 meters east to west by 9600 meters north to south for a total of 92.1 square kilometers. The

map display represents 31501 feet east to west by 31501 feet north to south for a total of 35.5 square miles.

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<http://www.national.geographic.com/topo>

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map assembled 2018-07-24 12:22:31 (qa/qc March 21, 2016 12:20 - tn=916926.0

dist=4828.032 Visitor )

\$poi=38.7918889 -77.4619444

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**Habitat Predicted for WAP Tier I and II Species**

38,47,30.8 -77,27,43.0 is the Search Point

**Show Position Rings**

Yes  No  
4 miles and 1 mile at the Search Point

**Show Search Area**

Yes  No  
3 Search distance miles radius

Search Point is at map center

**Base Map Choices**

Topography

**Map Overlay Choices**

Current List: Position, Search, TierReaches

**Map Overlay Legend**

**Predicted Habitat WAP Tier I & II**

 Aquatic

 Terrestrial

 Position Rings  
4 miles and 1 mile at the Search Point

 3 mile radius Search Area

38,52,26.2 -77,39,47.4

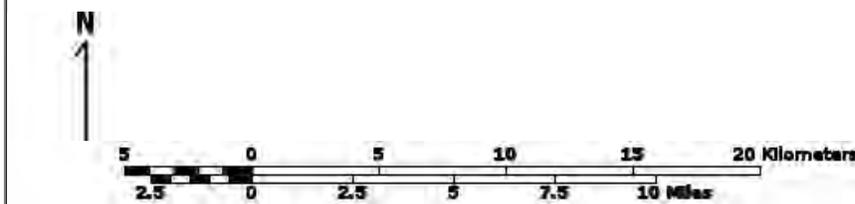
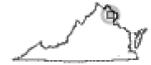
Map Click   

[Refresh Browser Page](#)

Map Scale   

Screen Size   

[Help](#)



Point of Search 38,47,30.8 -77,27,43.0

Map Location 38,47,30.8 -77,27,43.0

- Select **Coordinate System**:
- Degrees,Minutes,Seconds Latitude - Longitude
  - Decimal Degrees Latitude - Longitude
  - Meters UTM NAD83 East North Zone
  - Meters UTM NAD27 East North Zone

Base Map source: USGS 1:250,000 topographic maps (see [Microsoft terraserver-usa.com](http://Microsoft.terraserver-usa.com) for details)

Map projection is UTM Zone 18 NAD 1983 with left 266981 and top 4315762. Pixel size is 64 meters . Coordinates displayed are Degrees, Minutes, Seconds North and West. Map is currently displayed as 600 columns by 600 rows for a total of 360000 pixels. The map display represents 38400 meters east to west by 38400 meters north to south for a total of 1474.5 square kilometers.

The map display represents 126005 feet east to west by 126005 feet north to south for a total of 569.5 square miles.

Topographic maps and Black and white aerial photography for year 1990+ are from the United States Department of the Interior, United States Geological Survey. Color aerial photography aquired 2002 is from Virginia Base Mapping Program, Virginia Geographic Information Network. Shaded topographic maps are from TOPO! ©2006 National Geographic <http://www.national.geographic.com/topo>  
All other map products are from the Commonwealth of Virginia Department of Game and Inland Fisheries.

map assembled 2018-07-24 12:24:47 (qa/qc March 21, 2016 12:20 - tn=916926.0  
dist=4828.032 Visitor )  
\$poi=38.7918889 -77.4619444

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Site Location

38,47,30.8 -77,27,43.0  
is the Search Point

Show Position Rings

Yes  No  
1 mile and 1/4 mile at the  
Search Point

Show Search Area

Yes  No  
3 Search distance miles  
radius

Search Point is at  
map center

Base Map [Choices](#)

Topography

Map Overlay [Choices](#)

Current List: Position, Search,  
BECAR, BAEANests,  
TEWaters, TierII, Habitat,  
Trout, Anadromous

Map Overlay Legend

Point of Search 38,47,30.8 -77,27,43.0

Map Location 38,47,30.8 -77,27,43.0

- Select **Coordinate System**:
- Degrees, Minutes, Seconds Latitude - Longitude
  - Decimal Degrees Latitude - Longitude
  - Meters UTM NAD83 East North Zone
  - Meters UTM NAD27 East North Zone

Base Map source: USGS 1:250,000 topographic maps (see [Microsoft terraserver-usa.com](http://Microsoft.com) for details)

Map projection is UTM Zone 18 NAD 1983 with left 276581 and top 4306162. Pixel size is 32 meters. Coordinates displayed are Degrees, Minutes, Seconds North and West. Map is currently displayed as 600 columns by 600 rows for a total of 360000 pixels. The map display represents 19200 meters east to west by 19200 meters north to south for a total of 368.6 square kilometers.

**T & E Waters**

Federal

State

**Predicted Habitat  
WAP Tier I & II**

Aquatic

Terrestrial

**Trout Waters**

Class I - IV

Class V - VI

**Anadromous Fish Reach**

Confirmed

Potential

**Impediment**

**Position Rings**  
 1 mile and 1/4  
 mile at the  
 Search Point


**3 mile radius  
 Search Area**
**Bald Eagle  
Concentration Areas  
and Roosts**

The map display represents 63002 feet east to west by 63002 feet north to south for a total of 142.3 square miles.

Topographic maps and Black and white aerial photography for year 1990+ are from the United States Department of the Interior, United States Geological Survey. Color aerial photography aquired 2002 is from Virginia Base Mapping Program, Virginia Geographic Information Network.

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All other map products are from the Commonwealth of Virginia Department of Game and Inland Fisheries.

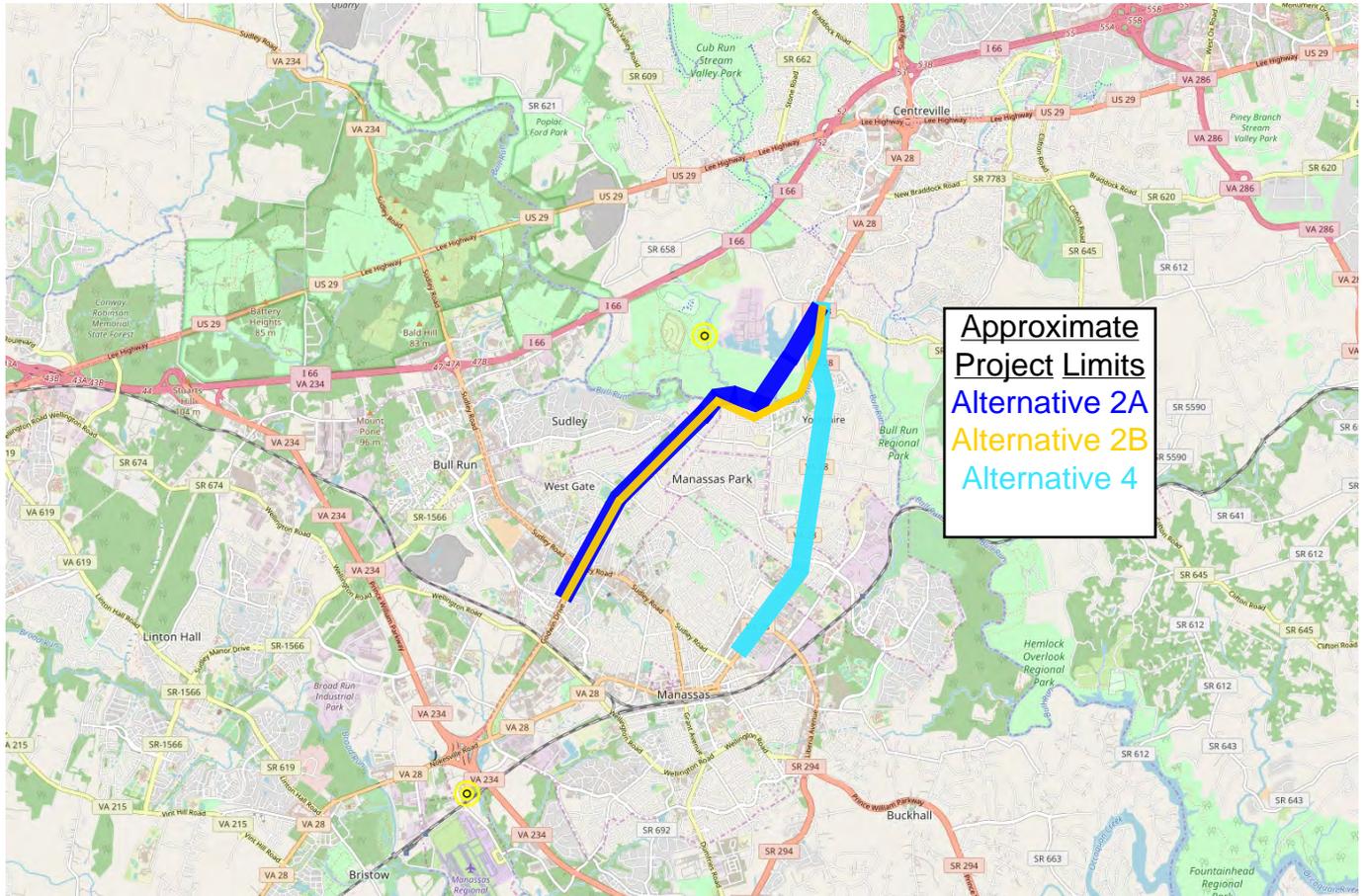
map assembled 2018-07-24 12:26:11 (qa/qc March 21, 2016 12:20 - tn=916926.0

dist=4828.032 Visitor )

\$poi=38.7918889 -77.4619444



# CCB Mapping Portal



**Layers:** VA Eagle Nest Locator, VA Eagle Nest Buffers

**Map Center [longitude, latitude]:** [-77.47438430786133, 38.785334699152635]

**Map Link:**

[http://www.ccbbirds.org/maps/#layer=VA+Eagle+Nest+Locator&layer=VA+Eagle+Nest+Buffers&zoom=13&lat=38.785334699152635&lng=-77.47438430786133&legend=legend\\_tab\\_7c321b7e-e523-11e4-aa0-0e0c41326911&base=Street+Map+%28OSM%29](http://www.ccbbirds.org/maps/#layer=VA+Eagle+Nest+Locator&layer=VA+Eagle+Nest+Buffers&zoom=13&lat=38.785334699152635&lng=-77.47438430786133&legend=legend_tab_7c321b7e-e523-11e4-aa0-0e0c41326911&base=Street+Map+%28OSM%29)

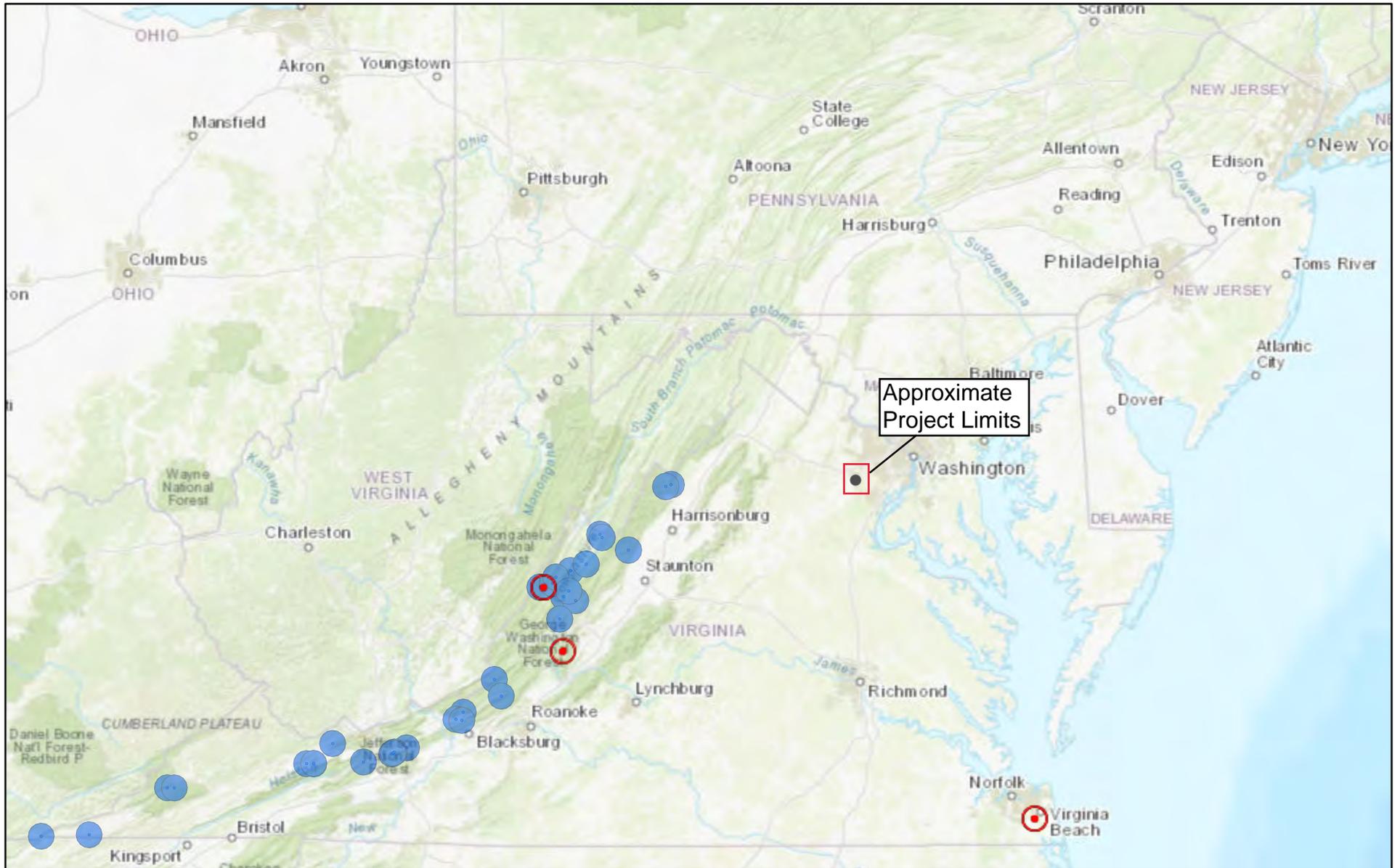
**Report Generated On:** 07/24/2018

The Center for Conservation Biology (CCB) provides certain data online as a free service to the public and the regulatory sector. CCB encourages the use of its data sets in wildlife conservation and management applications. These data are protected by intellectual property laws. All users are reminded to view the [Data Use Agreement](#), to ensure compliance with our data use policies. For additional data access questions, view our [Data Distribution Policy](#), or contact our Data Manager, Marie Pitts, at [mlpitts@wm.edu](mailto:mlpitts@wm.edu) or 757-221-7503.

Report generated by [The Center for Conservation Biology Mapping Portal](#).

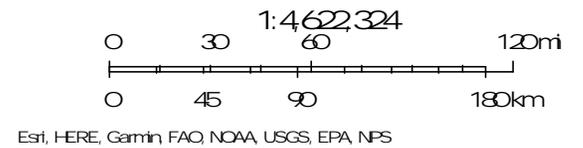
To learn more about CCB visit [ccbbirds.org](http://ccbbirds.org) or contact us at [info@ccbbirds.org](mailto:info@ccbbirds.org)

# NLEB Locations and Roost Trees

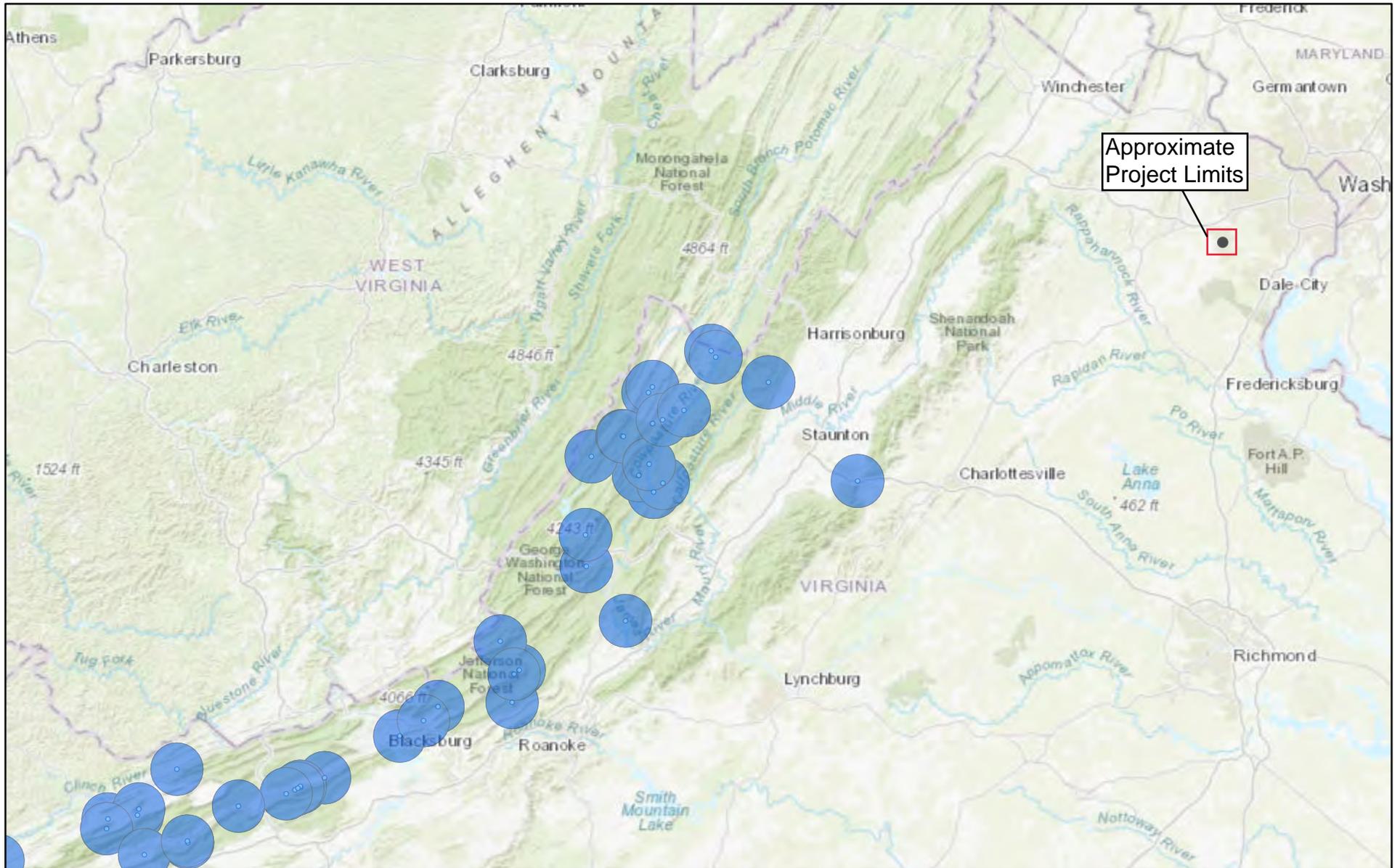


7/24/2018 8:41:33AM

-  NLEB Known Occupied Maternity Roost (Summer Habitat)
-  NLEB Hibernaculum 5.5 Mile Buffer
-  NLEB Hibernaculum Half Mile Buffer

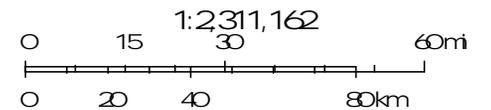


# ArcGIS Web Map



7/24/2018 8:43:07 AM

-  Tri-colored and Little Brown Hibernaculum Half Mile Buffer
-  Tri-colored and Little Brown Hibernaculum 55 Mile Buffer



Est. HERE, Garmin, FAO, USGS, EPA, NPS

Dept. Game and Inland Fisheries  
Est. HERE, Garmin, FAO, USGS, EPA, NPS |

Matthew J. Strickler  
Secretary of Natural Resources

Clyde E. Cristman  
Director



**COMMONWEALTH of VIRGINIA**  
DEPARTMENT OF CONSERVATION AND RECREATION

Rochelle Altholz  
Deputy Director of  
Administration and Finance

Russell W. Baxter  
Deputy Director of  
Dam Safety & Floodplain  
Management and Soil & Water  
Conservation

Thomas L. Smith  
Deputy Director of Operations

August 2, 2018

Sean Wender  
Stantec Consulting Services, Inc.  
1011 Boulder Springs Drive-Suite 225  
Richmond, VA 23225

Re: Route 28 Corridor Alternatives- 2A, 2B and 4

Dear Mr. Wender:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

**Alternative 2A, Alternative 2B and Alternative 4**

According to the information currently in our files, the Manassas stonefly (*Acroneuria flinti*, GH/SH/NL/NL) has historically been documented in Bull Run. This species was documented from a single specimen at a single location in Fairfax County. Very little information is available regarding this species' biology due to limited observations. A single adult female was collected beside Bull Run, a low gradient, often turbid, third order stream (Kondratieff & Kirchner, 1991). Adult stoneflies possess pleated or folded wings which lie flat against the abdomen when at rest. Stonefly nymphs are aquatic, preferring pristine, cold, running waters. They may be carnivorous, herbivorous, or both. Stoneflies are good indicators of water quality (Kondratieff & Kirchner, 1991). Due to current land practices in the Bull Run watershed, the stream is subject to both organic and inorganic enrichment and heavy sedimentation, which may adversely affect this species (Kondratieff & Kirchner, 1991).

To minimize adverse impacts to the aquatic ecosystem as a result of the proposed activities, DCR recommends the implementation of and strict adherence to applicable state and local erosion and sediment control/storm water management laws and regulations.

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

In addition, the proposed Alternatives 2B and 4 will fragment C5 cores as identified in the Virginia ConservationVision. The Virginia ConservationVision is a GIS analysis for identifying and prioritizing conservation lands in Virginia. ([http://www.dcr.virginia.gov/natural\\_heritage/vaconvision.shtml](http://www.dcr.virginia.gov/natural_heritage/vaconvision.shtml))

600 East Main Street, 24<sup>th</sup> Floor | Richmond, Virginia 23219 | 804-786-6124

*State Parks • Soil and Water Conservation • Outdoor Recreation Planning  
Natural Heritage • Dam Safety and Floodplain Management • Land Conservation*

Cores are areas of unfragmented natural cover with at least 100 acres of interior condition and provide habitat for a wide range of species, from interior-dependent forest species to habitat generalists, as well as species that utilize marsh, dune, and beach habitats. Cores also provide benefits in terms of open space, recreation, water quality (including drinking water protection), and carbon sequestration, along with the associated economic benefits of these functions. The cores are ranked from 1 to 5 (5 being the least ecologically relevant) using many prioritization criteria, such as the number of natural heritage resources (i.e. rare species) occurring in a core.

Fragmentation occurs when a large, contiguous ecosystem is transformed into one or more smaller patches surrounded by disturbed areas resulting from the conversion and development. Habitat fragmentation results in biogeographic changes that disrupt species interactions and ecosystem processes, reducing biodiversity and habitat quality due to limited recolonization, increased predation and egg parasitism, and increased invasion by weedy species.

Therefore minimizing fragmentation is a key mitigation measure that will preserve the natural patterns and connectivity of habitats that are key components of biodiversity. The deleterious effects of fragmentation can be reduced by minimizing edge in remaining fragments (leaving round versus long, skinny fragments); by retaining connective corridors that allow significant migration between fragments; and by designing the intervening landscape to minimize its hostility to native wildlife (natural cover versus lawns).

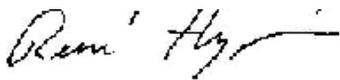
New and updated information is continually added to Biotics. Please re-submit a completed order form and project map for an update on this natural heritage information if the scope of the project changes and/or six months has passed before it is utilized.

A fee of \$805.00 has been assessed for the service of providing this information. Please find attached an invoice for that amount. Please return one copy of the invoice along with your remittance made payable to the Treasurer of Virginia, DCR Finance, 600 East Main Street, 24<sup>th</sup> Floor, Richmond, VA 23219. Payment is due within thirty days of the invoice date. Late payment may result in the suspension of project review service for future projects.

The Virginia Department of Game and Inland Fisheries (VDGIF) maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from <http://vafwis.org/fwis/> or contact Ernie Aschenbach at 804-367-2733 or [Ernie.Aschenbach@dgif.virginia.gov](mailto:Ernie.Aschenbach@dgif.virginia.gov).

Should you have any questions or concerns, feel free to contact me at (804) 692-0984. Thank you for the opportunity to comment on this project.

Sincerely,



S. René Hypes  
Natural Heritage Project Review Coordinator

## Literature Cited

Kondratieff, B.C. and R.F. Kirchner. 1991. Stoneflies. In Virginia's Endangered Species: Proceedings of a Symposium. K. Terwilliger ed. The McDonald and Woodward Publishing Company, Blacksburg, Virginia. pp. 214-221.

**APPENDIX B:**  
**THREATENED AND ENDANGERED SPECIES**  
**HABITAT ASSESSMENT MAPS**

Alternative 2A Habitat Data

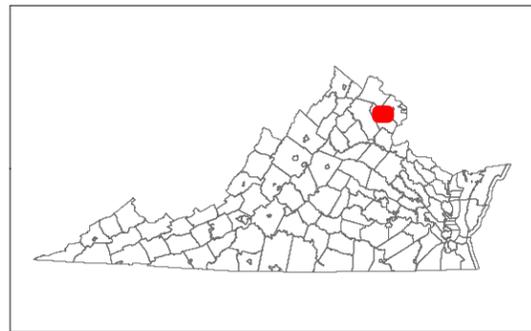
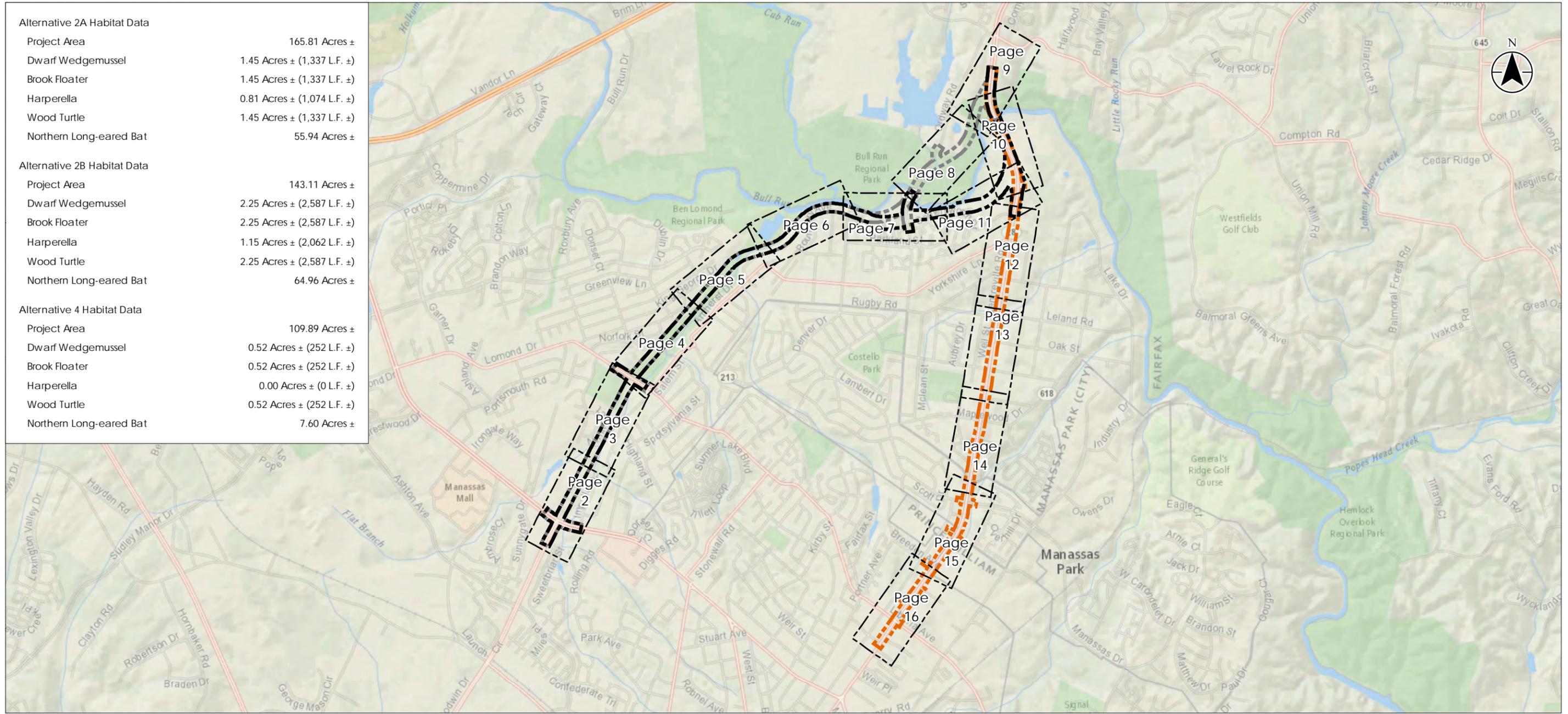
Project Area	165.81 Acres ±
Dwarf Wedgemussel	1.45 Acres ± (1,337 L.F. ±)
Brook Floater	1.45 Acres ± (1,337 L.F. ±)
Harperella	0.81 Acres ± (1,074 L.F. ±)
Wood Turtle	1.45 Acres ± (1,337 L.F. ±)
Northern Long-eared Bat	55.94 Acres ±

Alternative 2B Habitat Data

Project Area	143.11 Acres ±
Dwarf Wedgemussel	2.25 Acres ± (2,587 L.F. ±)
Brook Floater	2.25 Acres ± (2,587 L.F. ±)
Harperella	1.15 Acres ± (2,062 L.F. ±)
Wood Turtle	2.25 Acres ± (2,587 L.F. ±)
Northern Long-eared Bat	64.96 Acres ±

Alternative 4 Habitat Data

Project Area	109.89 Acres ±
Dwarf Wedgemussel	0.52 Acres ± (252 L.F. ±)
Brook Floater	0.52 Acres ± (252 L.F. ±)
Harperella	0.00 Acres ± (0 L.F. ±)
Wood Turtle	0.52 Acres ± (252 L.F. ±)
Northern Long-eared Bat	7.60 Acres ±



-  Page Index
-  Alternative 2A Limits
-  Alternative 2B Limits
-  Alternative 4 Limits



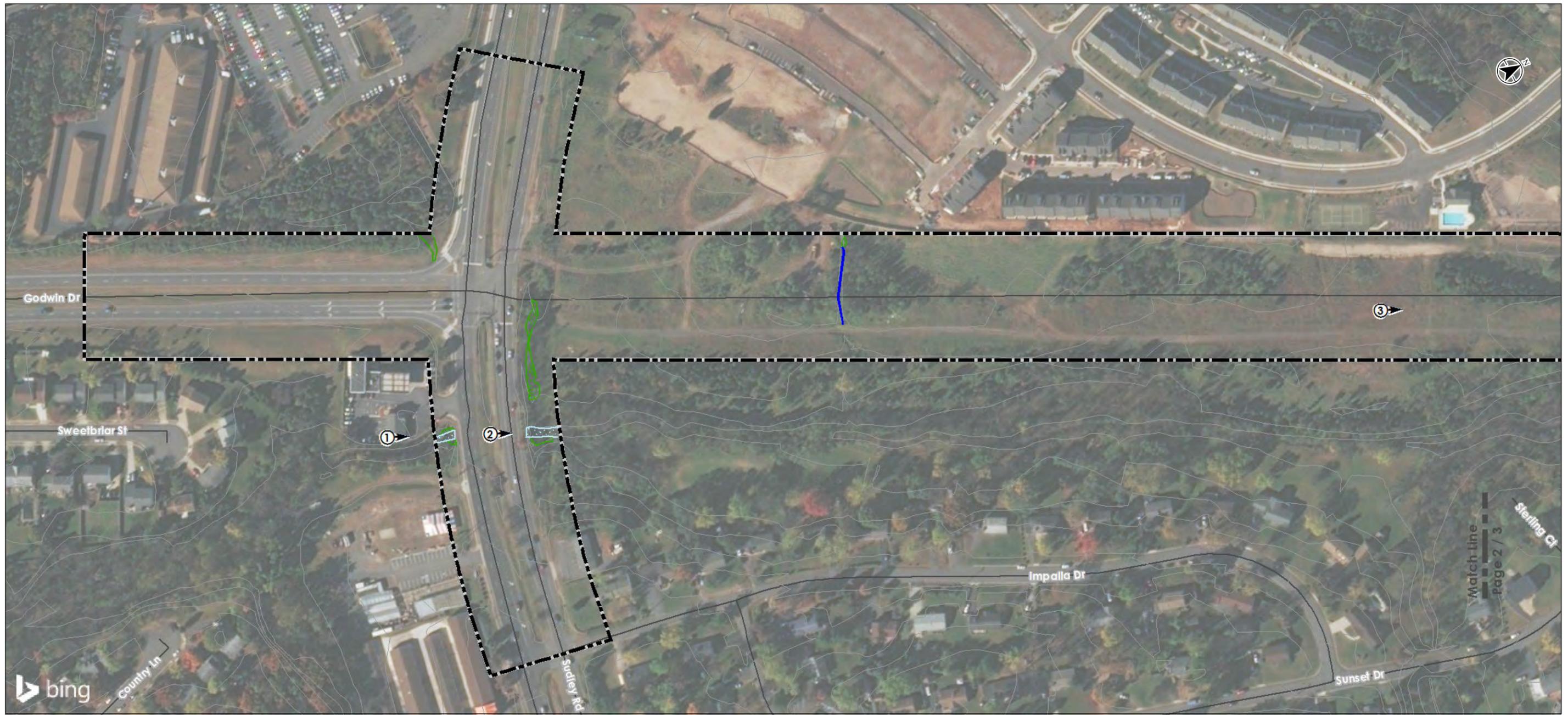
Project Location: Prince William County, City of Manassas, Manassas Park, and Fairfax County, Virginia  
 Prepared by TPS on 2018-07-25  
 Technical Review by MGS on 2018-07-26  
 Independent Review by SW on 2018-07-26

Client/Project: Parsons Transportation Group, Inc. Environmental Documentation for Route 28 Corridor

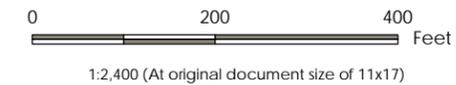
Figure No. 2

Title: Threatened and Endangered Species Habitat Map

- Notes
- Coordinate System: NAD 1983 StatePlane Virginia North FIPS 4501 Feet
  - Project limits provided by Parsons Transportation Group, Inc.
  - Base Map © National Geographic



- |                       |  |
|-----------------------|--|
| Alternative 2A Limits | Dwarf Wedgemussel, Brook Floater & Wood Turtle             |
| Alternative 2B Limits | Dwarf Wedgemussel, Brook Floater, Harperella & Wood Turtle |
| Alternative 4 Limits  | Approximate Palustrine Emergent Wetland Limits (PEM)       |
| 2-Foot Contour        | Approximate Palustrine Scrub-Shrub Wetland Limits (PSS)    |
| Photo Location        | Approximate Palustrine Forested Wetland Limits (PFO)       |
|                       | Approximate Upper Perennial Stream Channel Limits (R3)     |
|                       | Approximate Intermittent Stream Channel Limits (R4)        |
|                       | Approximate Ephemeral Stream Channel Limits (R6)           |



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Client/Project: Parsons Transportation Group, Inc.  
 Environmental Documentation for  
 Route 28 Corridor

Figure No.  
 2

Title  
 Threatened and Endangered  
 Species Habitat Map

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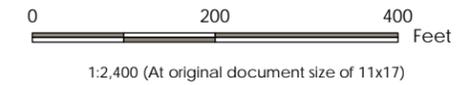
3. Project limits provided by Parsons Transportation Group, Inc.  
 4. Topography provided by Prince William and Fairfax Counties  
 5. Orthoimagery © Bing Maps  
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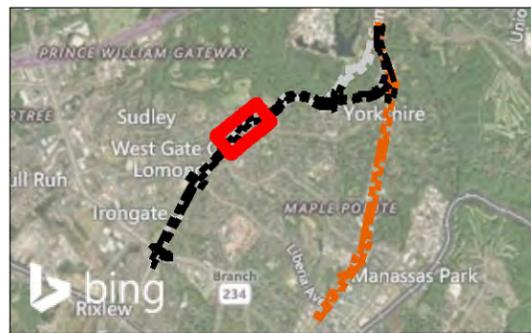
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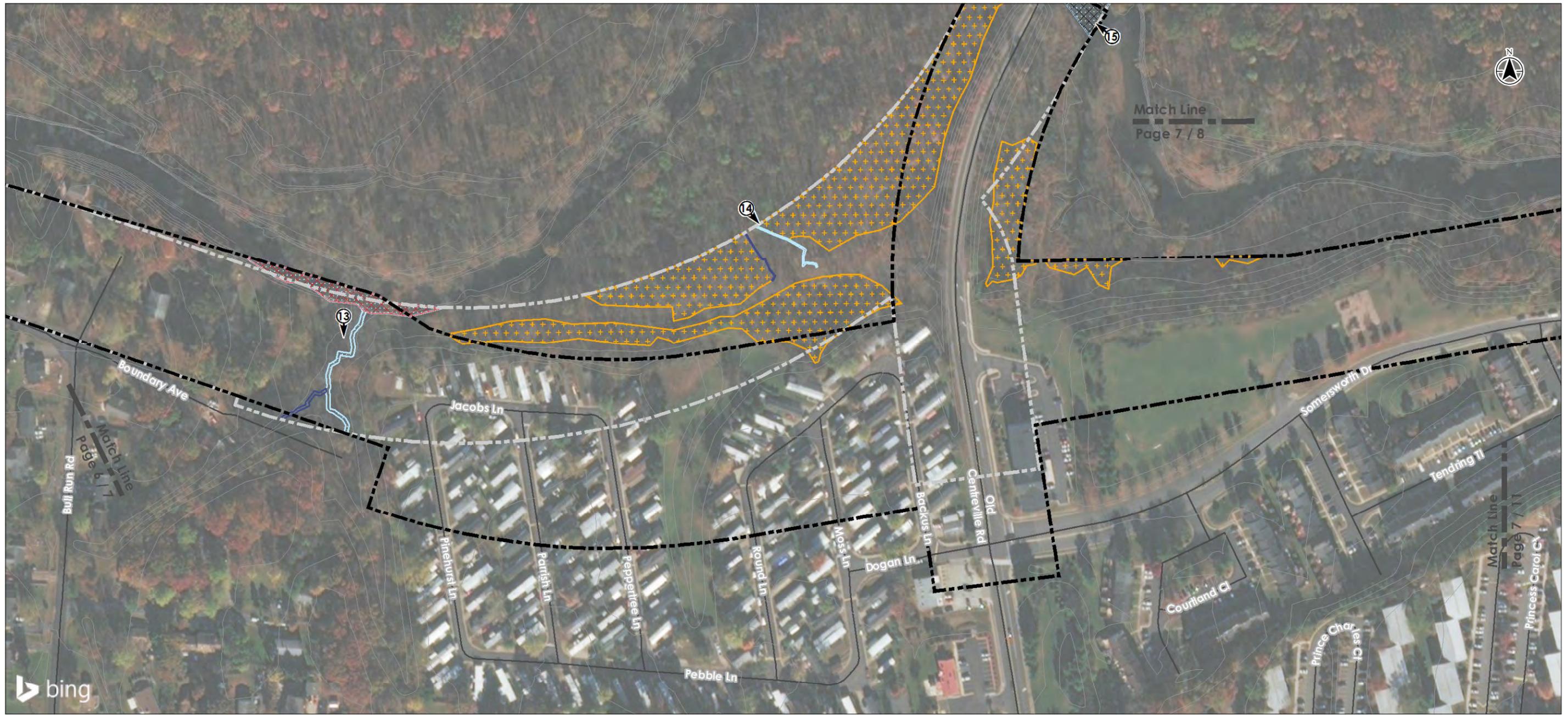
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Page 7 / 8

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Page 6 / 7

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Page 7 / 11



- Alternative 2A Limits
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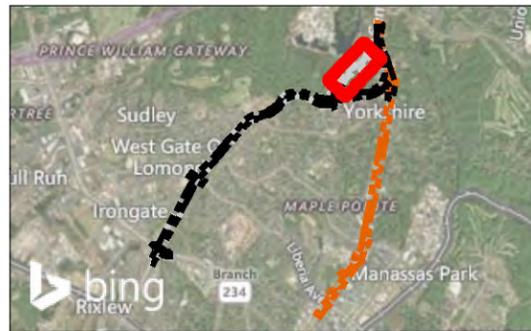
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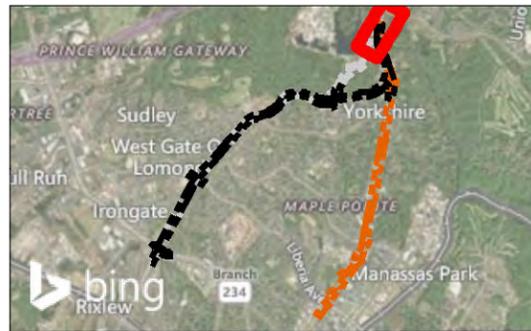
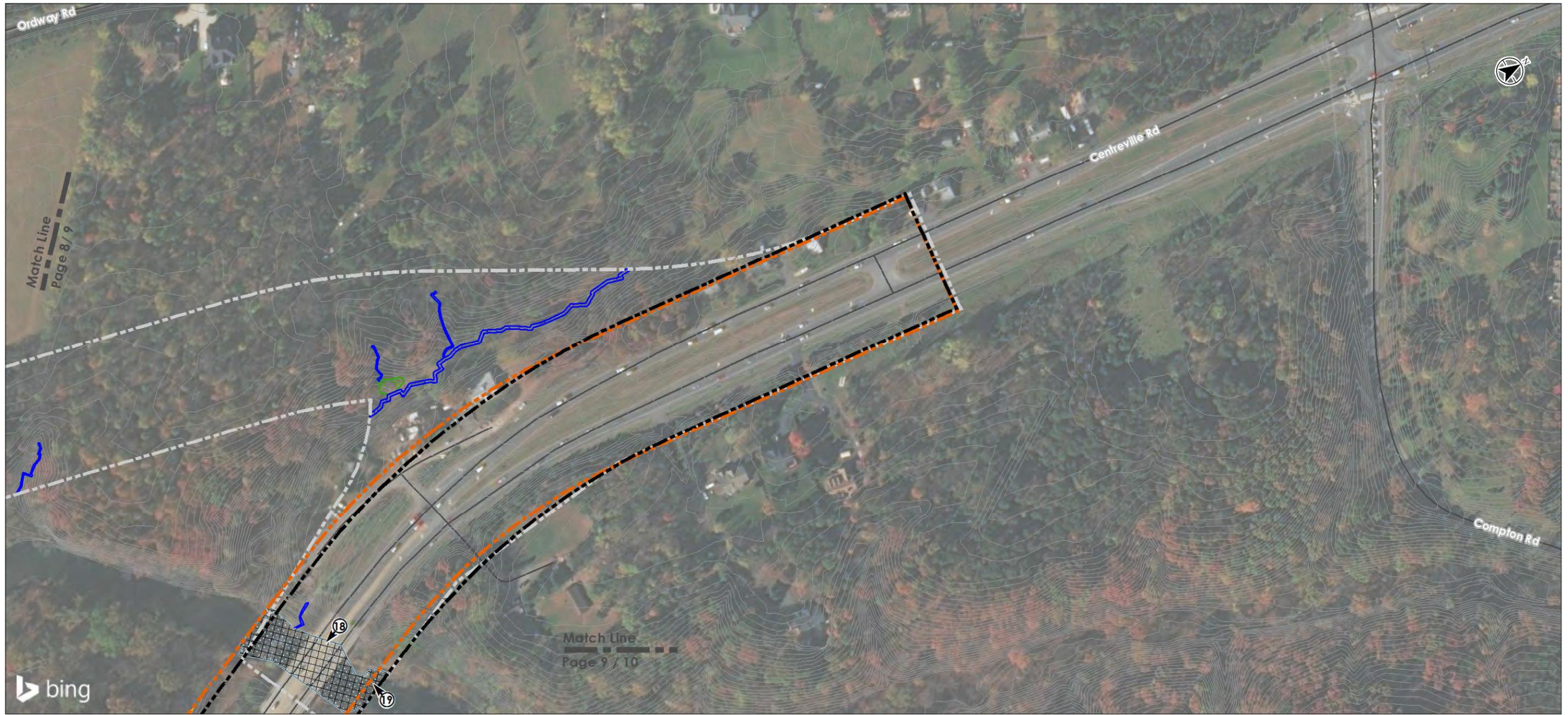
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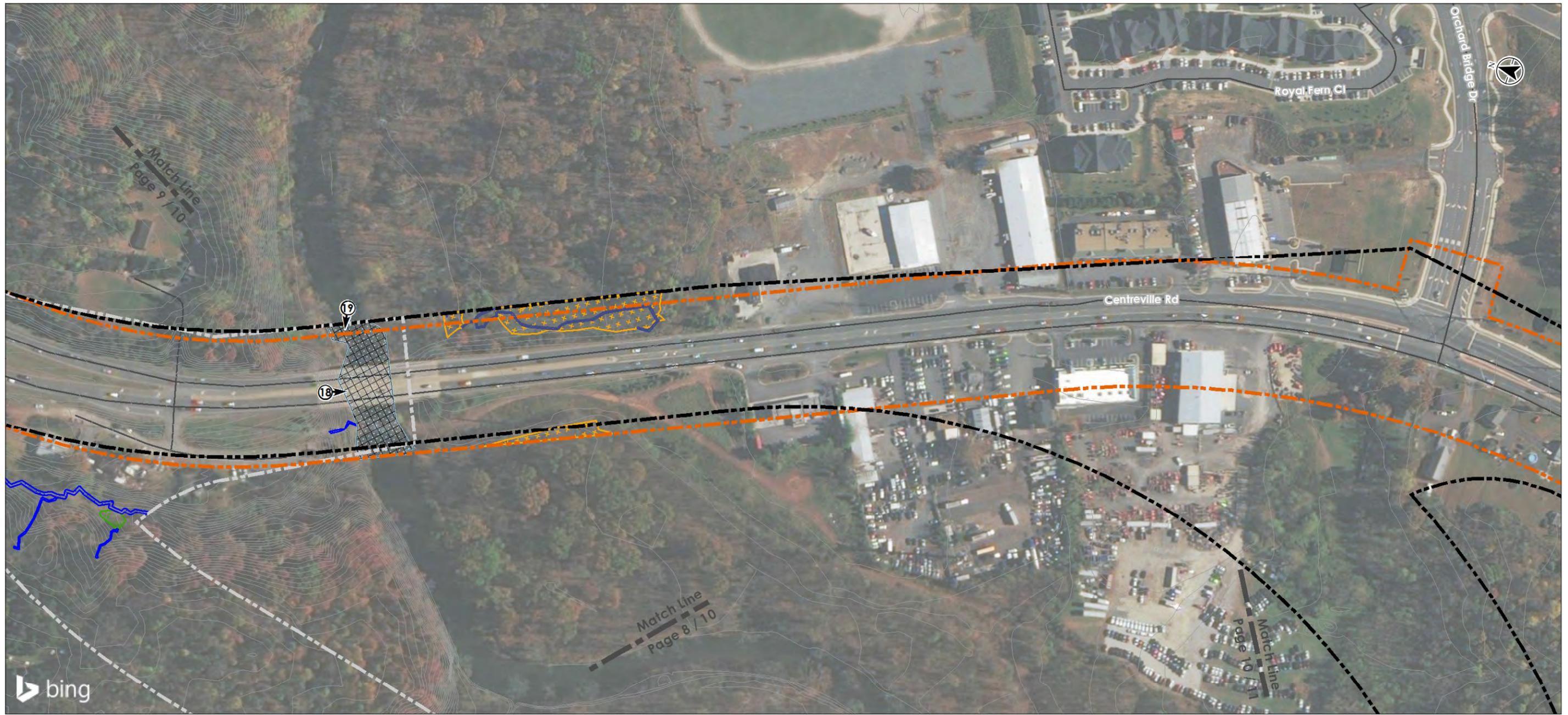
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- Alternative 2A Limits
- Alternative 2B Limits
- Alternative 4 Limits
- 2-Foot Contour
- Photo Location
- Dwarf Wedgemussel, Brook Floater & Wood Turtle
- Dwarf Wedgemussel, Brook Floater, Harperella & Wood Turtle
- Approximate Palustrine Emergent Wetland Limits (PEM)
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Project Location: Prince William County, City of Manassas, Manassas Park, and Fairfax County, Virginia  
 Prepared by TPS on 2018-07-25  
 Technical Review by MGS on 2018-07-26  
 Independent Review by SW on 2018-07-26

Client/Project: Parsons Transportation Group, Inc. Environmental Documentation for Route 28 Corridor

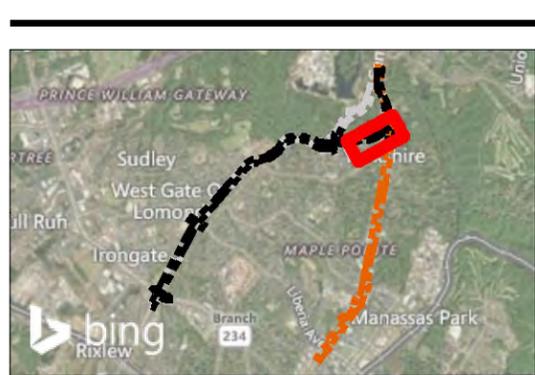
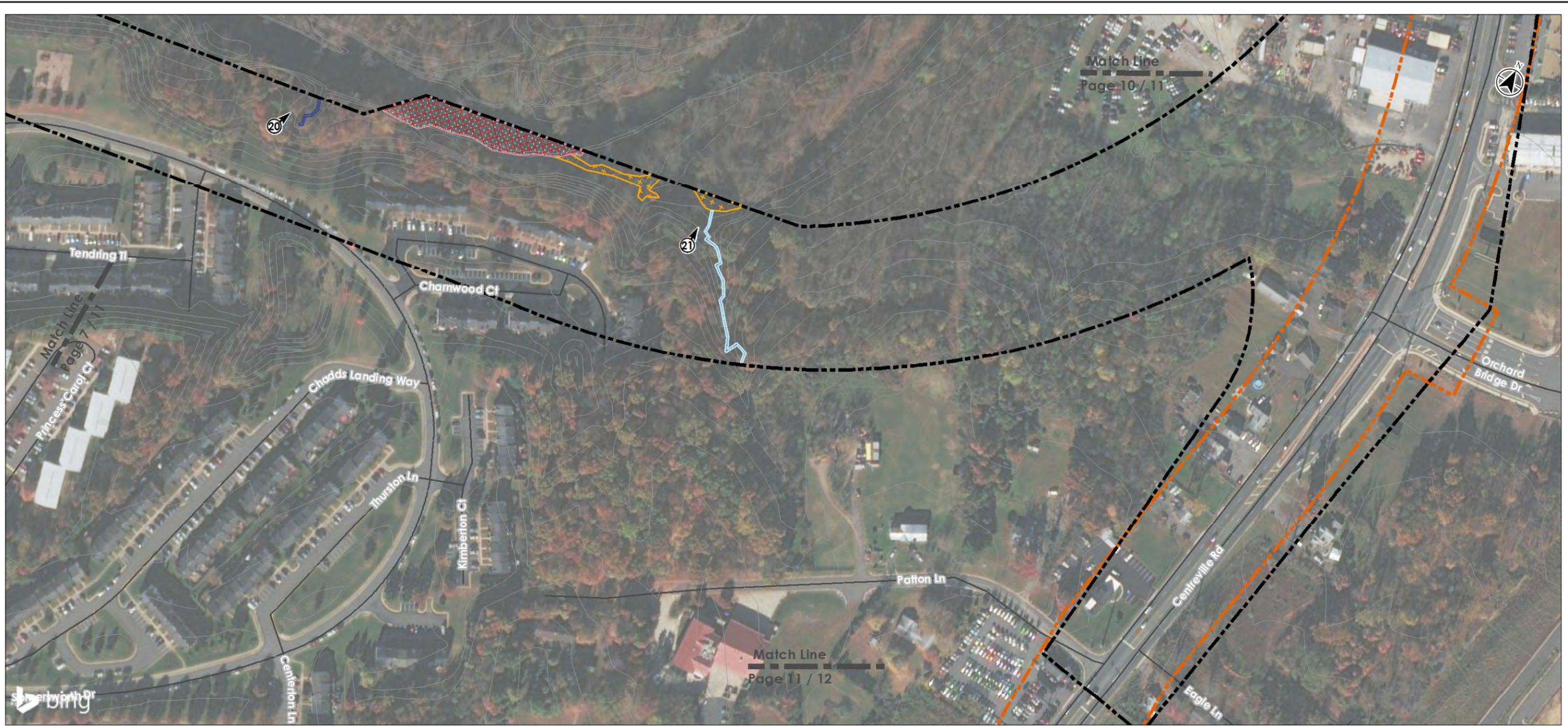
Figure No. 2

Title: Threatened and Endangered Species Habitat Map

Notes:  
 1. Coordinate System: NAD 1983 StatePlane Virginia North FIPS 4501 Feet  
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Title: Threatened and Endangered Species Habitat Map

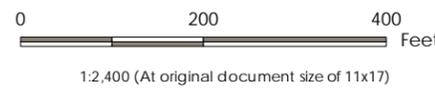
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- |                       |  |
|-----------------------|--|
| Alternative 2A Limits | Dwarf Wedgemussel, Brook Floater & Wood Turtle             |
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| Alternative 4 Limits  | Approximate Palustrine Emergent Wetland Limits (PEM)       |
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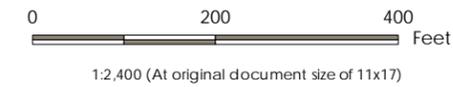
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- |                       |  |
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**APPENDIX C:**  
**REPRESENTATIVE PHOTOS**



**Photo 1:**  
**View Northeast**  
Unsuitable habitat for aquatic species within Flat Branch due to extensive riprap and sediment upstream of Sudley Road. Wood turtles could use stream as a corridor to suitable habitat upstream and downstream.



**Photo 2:**  
**View Northeast**  
Unsuitable habitat for aquatic species within Flat Branch due to heavy sediment deposits and lack of suitable instream structure downstream of Sudley Road. Potential corridor for wood turtles to access other habitat areas.



**Photo 3:**  
**View Northeast**  
Maintained easement with remnant forested areas to the west and riparian buffer of Flat Branch to the east. Forest provides suitable sized trees and structure for NLEB roosts.



**Photo 4:**  
**View Northeast**  
Unnamed tributary to Flat Branch lacking suitable hydrology for aquatic species.



**Photo 5:**  
**View East**  
**Suitable habitat for mussels and wood turtle downstream of Lomond Drive. Marginal habitat for harperella. Same conditions exist upstream.**



**Photo 6:**  
**View West**  
**Lomond Drive crossing of Flat Branch. No signs of bat use detected in cursory review.**



**Photo 7:**  
**View North**  
**Representative photograph of mature forested corridor along easement. Suitable sized trees and snags present for NLEB.**



**Photo 8:**  
**View West**  
**Unnamed tributary to Flat Branch. Unsuitable habitat for aquatic species due to unsuitable hydrology and instream structure.**



**Photo 9:**  
**View Southeast**  
Unnamed tributary to Flat Branch with unsuitable habitat for aquatic species due to hydrologic regime and instream structure. Riparian wetlands adjacent to stream and within easement to the east provide suitable habitat for wood turtle.



**Photo 10:**  
**View Southeast**  
Unnamed tributary to Flat Branch with unsuitable habitat for aquatic species due to hydrologic regime and instream structure.



**Photo 11:**  
**View Northeast**  
Unsuitable habitat within Flat Branch for aquatic species due to gabion baskets on banks and highly embedded with silt. Stream may be used as a corridor for wood turtle to access suitable habitat upstream and downstream.



**Photo 12:**  
**View North**  
Riparian area suitable for wood turtle and mature hardwood forest provides suitable roosting for NLEB.



**Photo 13:**  
**View South**  
Unnamed tributary to Bull Run with unsuitable habitat for aquatic species due to hydrologic regime and instream structure. Riparian area suitable for wood turtle and mature hardwood forest provides suitable roosting for NLEB.



**Photo 14:**  
**View Southeast**  
Unnamed tributary to Bull Run with unsuitable habitat for aquatic species due to hydrologic regime and instream structure. Riparian area suitable for wood turtle and mature hardwood forest provides suitable roosting for NLEB.



**Photo 15:**  
**View Northwest**  
Suitable habitat for mussels and wood turtle within Bull Run downstream of Old Centreville Road. Vertical banks and lack of stable sediment bars provide unsuitable habitat for harperella.



**Photo 16:**  
**View Southwest**  
Crossing of Old Centreville Road over Bull Run. No signs of bat use observed during cursory review of bridge.



**Photo 17:**  
**View Southeast**  
Unnamed tributary to Bull Run along the northbound lanes of Route 28. Suitable structure for wood turtle and mussels with few potential areas for harperella. Dense populations of Asiatic clam and Chinese mystery snails observed.



**Photo 18:**  
**View South**  
Crossing of Route 28 over Bull Run. Signs of use of the bridge as a roost by bats observed during a cursory review of the bridge.



**Photo 19:**  
**View Southwest**  
Suitable habitat in Bull Run for mussels and wood turtle. Vertical banks, rip rap, and lack of stable sediment bars provide unsuitable habitat for harperella.



**Photo 20:**  
**View North**  
Intermittent stream draining north into Bull Run. Riparian area suitable for wood turtle and mature hardwood forest provides suitable roosting for NLEB.



**Photo 21:**  
**View Northwest**  
Unnamed tributary to Bull Run with unsuitable habitat for aquatic species due to hydrologic regime and instream structure. Riparian area suitable for wood turtle and mature hardwood forest provides suitable roosting for NLEB.



**Photo 22:**  
**View North**  
Unsuitable habitat for NLEB on unimproved lot along Route 28.



**Photo 23:**  
**View East**  
Unnamed tributary draining east under Route 28. Unsuitable habitat for aquatic species due to hydrologic regime, sediment, and instream structure. Narrow forested corridor along stream provides suitable size roost trees for NLEB.



**Photo 24:**  
**View East**  
Unnamed tributary draining east under Route 28. Unsuitable habitat for aquatic species due to hydrologic regime and rip-rap. Narrow forested corridor along stream provides suitable size roost trees for NLEB.



**Photo 25:**

**View North**

**Unsuitable habitat along southbound lanes of Route 28. Trees in background of suitable size for roosting by NLEB but unlikely due to fragmented nature of forest, lighting, and noise.**



**Photo 26:**

**View South**

**Unsuitable habitat along northbound lanes of Route 28. The forested area to the east contains suitable size roost trees for NLEB and is the edge of larger section of forest. Use of the forest by NLEB within the project area is unlikely due to lighting and noise.**



**Photo 27:**

**View North**

**Unsuitable habitat along southbound lanes of Route 28. Trees in background of suitable size for roosting by NLEB but unlikely due to fragmented nature of forest, lighting, and noise.**