



WETLAND STATEMENT OF FINDINGS

NATCHEZ TRACE MULTI-USE TRAIL
PROJECT NATR 055898-3P18
MILEPOST 95.8 TO 200 FEET WEST OF LIVINGSTON ROAD
(APPROXIMATELY FROM MILEPOST 95.8 TO MILEPOST 97.85)

NATCHEZ TRACE PARKWAY

MADISON COUNTY, MISSISSIPPI

Recommended:  7/14/2010
Superintendent, Natchez Trace Parkway Date

Concurred:  7/19/2010
Water Resources Division Date

Approved:  7-27-10
Southeast Regional Director Date

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INTRODUCTION

The National Park Service (NPS), in cooperation with the Federal Highway Administration (FHWA), is proposing to design and construct approximately 2.05 miles of multi-use trail, hereafter referred to as the trail, from milepost 95.8 to 200 feet west of Livingston Road (approximate milepost 97.85) within the Natchez Trace Parkway (NATR) boundaries. This project is being funded by Federal Lands Highway Program (FLHP) Category II funding for Congressionally Mandated Parkways.

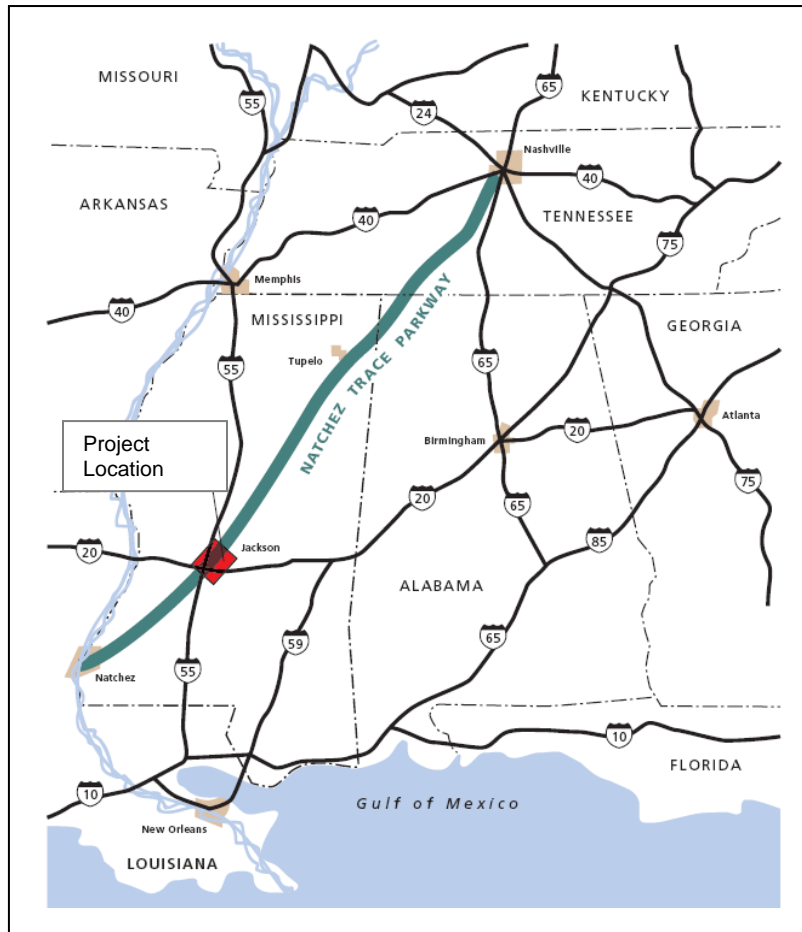


Figure 1. Project location on the Natchez Trace Parkway.

The trail segment will be located in the Jackson, Mississippi metropolitan area, as depicted in Figure 1. The NPS proposes to construct the 2.05-mile long trail segment along the north side of the NATR motor road. See Sheets No. A3-A4 of the FHWA Location Maps in Appendix A. The FHWA Location Maps are 95% complete, subject to changes and have not yet been finalized for construction. The trail will follow the conceptual alignment identified in the September 1995 *Multi-Use Trail Study Environmental Assessment, Natchez Trace Parkway, Jackson, Mississippi*, (EA) (NPS 1995), subject to changes identified during design, and approved by the NPS. In a 1996 Finding of No Significant Impact (FONSI) (NPS 1996) the NPS approved the preferred

alternative for building an approximately 21-mile long trail adjacent to the NATR motor road as it passes through the Jackson, Mississippi metropolitan area (Figure 2).

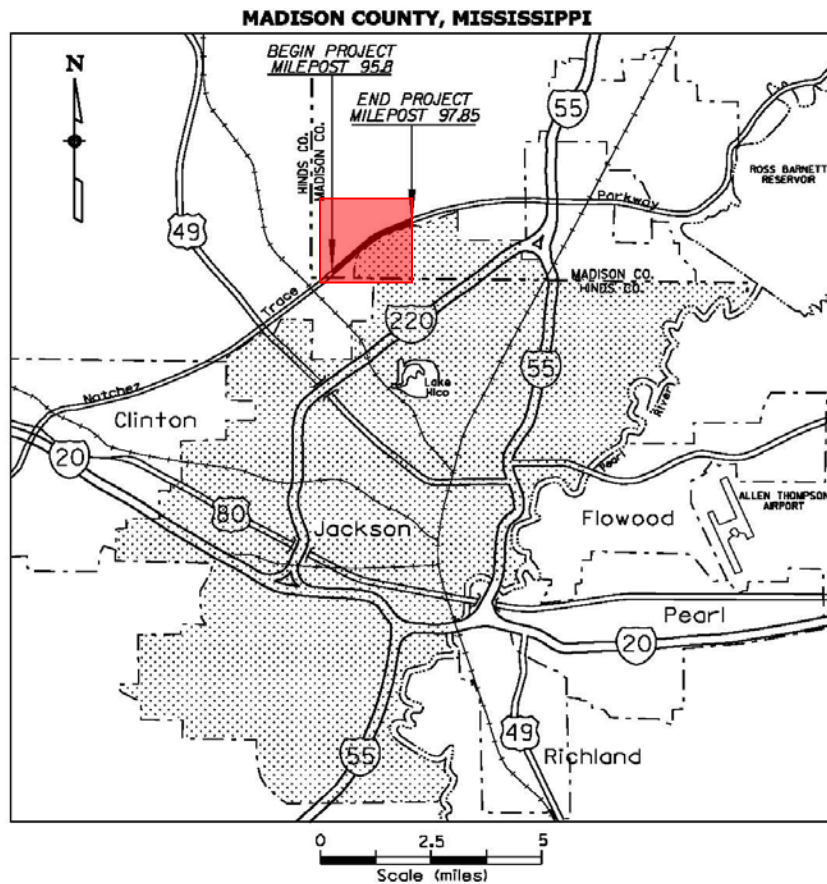


Figure 2. Project location.

The trail profile will closely match the existing ground elevations. See Sheet No. A8 of the FHWA Location Maps in Appendix A for a typical trail section. The limits of disturbance to build the trail will vary, depending on the topography. Based on the 95 percent complete trail design there appears to be a total of 2.19 acres of wetland impacts in this project; 1.80 acres of Palustrine Forested Broad-leaved Deciduous Wetland, 0.05 of an acre of Riverine Lower Perennial Emergent Nonpersistent Wetland, and 0.34 of an acre of Palustrine Emergent Persistent Wetland. For ease of reading the terms Palustrine Forested Broad-leaved Deciduous Wetland, Riverine Lower Perennial Emergent Nonpersistent Wetland, and Palustrine Emergent Persistent Wetland will be shortened to Palustrine Forested Wetland, Riverine Emergent Wetland, and Palustrine Emergent Wetland respectively. These impacts are described in detail further in the document.

Wetlands along Hanging Moss Creek intersecting the trail at Station 52+85 to Station 53+06 and wetlands intersecting the trail at Station 133+91 to Station 134+31 were delineated in 2008 as Riverine Emergent Wetland (Amy S. Green Environmental Consultants [ASGEC] 2008). Station locations, such as Station 52+85 can be located on the Location Map sheets that illustrate the trail route located in Appendix A. Locations are identified by such stations throughout the

document. Wetlands intersecting the trail from Station 58+56 to Station 61+97 were delineated as Palustrine Emergent Wetland. The trail will also traverse 1.80 acres of Palustrine Forested Wetland interspersed along the length of the trail (ASGEC 2008).

One 24-inch culvert will be installed in a small drainage at Station 51+30. One double 8-foot span, 8-foot rise concrete box culvert will be installed in the Riverine Emergent Wetlands intersecting the trail from approximately Station 52+85 to Station 53+06. One 36-inch culvert will be installed at Station 59+44 in the Palustrine Emergent Wetlands intersecting the trail from Station 58+56 to Station 61+97. See Sheet No. D1 of the FHWA Location Map Sheets in Appendix A.

A 24-inch culvert will be installed at Station 81+90. A Portland Cement Concrete waterway will be installed from Station 97+50 to Station 98+60 to prevent erosion of the slope. An 18-inch culvert will be installed at Station 98+60. Two 18-inch culverts will be installed in drainage ditches on both sides of County Road C. See Sheet No. D2 of the FHWA Location Map Sheets in Appendix A.

One 10-foot span, 6-foot rise concrete box culvert will be installed at Station 124+50 in the Palustrine Forested Wetlands intersecting the trail from approximately Station 122+14 to Station 124+74. See Sheet No. D3 of the FHWA Location Map Sheets in Appendix A.

One 24-inch culvert will be installed at Station 132+00 in the Palustrine Forested Wetlands intersecting the trail from Station 129+84 to Station 132+80, and a double 10-foot span, 6-foot rise concrete box culvert will be installed at Station 134+05 in the Riverine Emergent Wetlands intersecting the trail from Station 133+91 to Station 134+31. A double 24-inch culvert at Station 141+26, another 24-inch culvert at Station 144+50, and a 24-inch culvert at Station 148+60 will be installed in the Palustrine Forested Wetlands intersecting the trail from approximately Station 141+26 to Station 154+90. See Sheet No. D4 of the FHWA Location Map Sheets in Appendix A.

An 18-inch culvert will be installed at Station 154+20, and a 24-inch culvert will be installed at Station 157+00 to improve drainage. See Sheet No. D5 of the FHWA Location Map Sheets in Appendix A.

Class 3 riprap is usually used at culvert outlets. The abovementioned 18-inch culverts will have approximately 2.2 tons of Class 3 riprap placed around each one for stabilization. The 24-inch culverts will have 3.8 tons of Class 3 riprap placed around each one. Box culverts will usually have a 15-foot long by headwall width wide by 2-foot deep deposit of class 3 riprap placed around each one for stabilization.

The 1995 EA included analysis of three alternatives for accommodating trail users within the NATR motor road right-of-way in the vicinity of Jackson, Mississippi (NPS 1995). The preferred alternative, part of which is the 2.05-mile trail segment discussed in this statement of findings (SOF), provides a separate and continuous paved trail within the NATR motor road right-of-way, adjacent to the NATR motor road, connecting to local community trails, and potentially linking neighborhoods, parks, and tourist attractions throughout the greater Jackson, Mississippi, metropolitan area. The trail will maintain the visual qualities and character of the NATR motor road and surrounding landscape, accommodate the needs of a variety of trail user groups, and incorporate sustainable design and construction techniques and materials. The trail will be

designed to meet American Association of State Highway and Transportation Officials (AASHTO) standards and to Architectural Barriers Act Accessibility Standards (ABAAS), thus maintaining a profile grade of less than 5 percent and accommodating other necessary accessibility requirements.

The 1995 EA assessed the impacts of the three alternatives. Alternative 1 was a no action alternative; no trail will be constructed. Alternative 2, the preferred alternative and the alternative now being designed, was construction of a separate and continuous paved trail on NATR property from approximately milepost 86.6 to milepost 107.9. The trail will be separate from the NATR motor road. Alternative 3 was construction of three separate paved trail segments. The trail segments will be independent of one another.

Alternative 1, the no-action alternative, will have no impact on wetlands. Alternative 2 and alternative 3 will have adverse impacts on wetlands. The extent and level of impacts were not identified in the 1995 EA.

The 1995 EA indicated that adverse impacts to wetlands will be minimized by the use of temporary erosion control devices during construction, such as silt fences, slope drains, straw bales, inlet protection, plastic lining, loose riprap, sediment traps, diversion berms, and/or diversion channels in areas where there will be a potential to impact wetland areas. Permanent erosion control devices, such as loose riprap, paved waterways, and solid sod will be utilized at locations where the need exists.

Alternative 3 will have the same kinds of impacts as alternative 2 in the 2.05-mile multi-use trail project discussed in this SOF. Mitigation to minimize adverse impacts and to compensate for unavoidable impacts will be the same as for alternative 2.

An additional alternative, paving the roadside shoulders of the NATR motor road through the greater Jackson metropolitan area, was considered but rejected for a number of reasons. Foremost being the safety of non-motorized recreational users being placed immediately adjacent to vehicle traffic, incompatibility with the visual continuity and scenic character of the NATR experience afforded NATR visitors, and negative impacts on the historic design integrity of the NATR landscape experience.

This SOF has been prepared to comply with NPS Director's Order #77-1, which requires such statement to be prepared to document why an alternative with such impacts was chosen, and to meet the other requirements identified in the procedural manual for protection of wetlands (NPS Procedural Manual #77-1: Wetland Protection 1998).

PURPOSE AND NEED FOR THE ACTION

In 1938 the Natchez Trace Parkway was established as a unit of the NPS by Congress to commemorate the historic Natchez Trace – the principal overland link between the Southwest Territory and the Mississippi River and the United States during the late 18th and 19th centuries. The NATR motor road is designed to follow the alignment of the historic Natchez Trace as closely as possible.

In 1968 the National Trails Systems Act of 1968 (16 USC 1241-51) designated Natchez Trace as one of the initial trails to be studied for potential inclusion in the national trails system which

will provide “. . . for the ever-increasing outdoor recreation needs of an expanding population . . . to promote preservation of, public access to, travel within and enjoyment and appreciation of the open-air, outdoor areas and historic resources for the Nation.”

In 1983 the Natchez Trace Scenic Trail, established by Congress as a result of the Bureau of Outdoor Recreation (BOR) study and recommendations and the NPS were directed to designate a route.

The 1987 *Comprehensive Trail Plan, Natchez Trace National Scenic Trail / Alabama-Mississippi-Tennessee* (NPS 1987) developed in conjunction with the Natchez Trace Parkway General Management Plan (NATR-GMP) (NPS 1987), identified the Jackson, Mississippi, metropolitan area as one of three high use areas in which the NPS will build multi-use trails on NATR lands, but off of the NATR motor road. The Trail Plan states that; “Bicycling will continue along the entire developed length of the NATR. Bicycle use will be monitored however, and accommodations will be made to separate bicyclists and vehicular traffic where required in heavy use areas.”

By the 1990s increasingly heavy volumes of vehicular traffic on the NATR motor road through the Jackson, Mississippi, metropolitan area presented serious safety concerns for bicyclists traveling on the NATR motor road.

To address that concern, the 1995 EA identified two alternative multi-use trail routes and a no action alternative through the Jackson metropolitan area on NATR lands adjacent to the NATR motor road (NPS 1995). The preferred alternative, alternative 2, is a separate and continuous multi-use trail between approximately mileposts 86.6 and 107.9. The preferred alternative includes the segment of the multi-use trail north of the NATR motor road from milepost 95.8 to 200 feet west of Livingston Road (approximate milepost 97.85) that is the subject of this SOF.

In 1999 a Congressional Directive to the NPS directed the NATR to construct a multi-use trail in conjunction with the construction of the NATR motor road (U.S. Congress 1999). A subsequent Congressionally mandated feasibility study prepared by the Eastern Federal Lands Highway Division of the Federal Highway Administration (EFLHD/FHWA) in conjunction with the NPS, identified the Jackson, Mississippi, metropolitan area as one of three metropolitan areas transected by the NATR motor road where a multi-use trail should be built within the NATR boundaries, based on existing and projected future average daily traffic volumes (ADT).

Design Alternatives Considered

The multi-use trail analyzed as the preferred alternative in the 1995 EA had a paved surface 8 feet wide (NPS 1995). Because the minimum width of a multi-use trail currently recommended by AASHTO is now 10 feet, the trail design was widened to accommodate that new standard. That design change was addressed in a memo to file from the NATR Superintendent, dated March 27, 2007 (NPS 2007a) and is available at the NATR Headquarters.

The separate and continuous multi-use trail between approximately mileposts 86.6 and 107.9 will be constructed in segments at this time due to funding constraints. Design of a 2.2-mile segment (3016) of this multi-use trail from the 1995 EA was completed in 2008, and construction is scheduled to be completed in Spring/Summer 2010. Wetland impacts of that segment from Old Canton Road to Reservoir Overlook Parking Area (approximately from

milepost 103.6 to milepost 105.8) were analyzed in a Wetland SOF approved by the Southeast Regional Director in April 2008 (NPS 2008). In addition, a design of a 2.97-mile long trail segment (3P16) of this multi-use trail was completed in 2009, and construction is scheduled to be completed in December 2010. Wetland impacts of this segment from 2,000 feet east of Livingston Road to Highland Colony Parkway (approximately from milepost 98.23 to milepost 101.2) were analyzed in a Wetland SOF approved by the Southeast Regional Director in June 2009 (NPS 2009). Wetland impacts for bridges to be constructed in the 3P16 segment, which were designated as a separate project, 3P17, were also analyzed as part of the Wetland SOF approved by the Southeast Regional Director in June 2009 (NPS 2009). Design for 3P17 will be completed as part of the 3P18 project, and construction is scheduled to be completed in Fall 2011.

On May 23 through 25, 2007, NPS and EFLHD/FHWA staff, with staff from Parsons Corporation, conducted a Value Analysis and Value Engineering study (VA/VE) of the multi-use trail design for a 2.2-mile segment of proposed multi-use trail through the Jackson, Mississippi, metropolitan area. However, many of the following recommendations from the VA/VE for this segment will also be applicable to the entire 21 miles of multi-use trail. It was confirmed at the VA/VE that the multi-use trail will be located on NATR property, but away from the NATR motor road as much as feasible, and primarily within wooded areas, with intermittent views to and from the NATR motor road. The trail design and construction will be guided by the *AASHTO Guide for the Development of Bicycle Facilities* (AASHTO 1999), and by the Americans with Disabilities Act (ADA), superseded by the ABAAS (General Services Administration [GSA] 2006).

On November 4, 2009, an on-site field review of the 70 percent design plans for the current trail segment from milepost 95.8 to 200 feet west of Livingston Road (approximate milepost 97.85) was completed by staff from the EFLHD/FHWA, staff from NPS-NATR, and NPS-DSC. Consideration has been given to potential realignment of parts of the trail, to avoid or minimize impacts to wetlands while avoiding impacts to other resources, maintaining the desired NATR trail and NATR motor road character, and complying with other design criteria and the basis of planning and design from the 1995 EA (NPS 1995).

Wetlands in the project area

The project area, the segment of the trail from milepost 95.8 to 200 feet west of Livingston Road (approximate milepost 97.85) is characterized by Palustrine Forested Wetlands and some Palustrine and Riverine Emergent Wetland fringe areas interspersed with forested uplands. This area contains a number of utility/access pathways. Maintained, grassed turf areas border the NATR's motor road edge of pavement (ASGEC 2007).

The wetlands are heavily impacted by urban development. Many of the wetlands receive urban road and parking lot runoff; some are associated with drainage ditches, though a number of them are associated with intermittent streams and other perennial streams, Hanging Moss Creek and two unnamed streams. All of the wetlands have been impacted by urban development, directly by the construction of roads and housing developments or indirectly through the change in hydrology from water diversion associated with this urban development. This development has also aided in the isolation and fragmentation of these wetlands, further decreasing their function and value.

Invasive and/or exotic species, such as the non-native, invasive species, Chinese privet (*Ligustrum sinense*) and native, invasive species, water oak (*Quercus nigra*), are also common in the forested uplands and the wetlands. Chinese privet is listed as one of Mississippi's ten worst invasive weeds by the Mississippi State University Extension Service and is abundant throughout the study area (ASGEC 2008).

Wetlands have been delineated by an NPS contractor, ASGEC, as required by the 1995 EA, which directed that SOFs will be completed prior to trail construction and appended to the EA (NPS 1995). For purposes of compliance with Executive Order 11990, the NPS uses "Classification of Wetlands and Deepwater Habitats of the United States," (U.S. Fish and Wildlife Service [USFWS], Cowardin et al. 1979) as the standard for defining, classifying, and inventorying wetlands. Field delineation of wetlands was performed at the sites in January and February 2008 (ASGEC 2008). Vegetation, soils, and hydrology were examined for evidence of wetland characteristics according to the three-parameter approach methodology outlined in the U.S. Army Corps of Engineers (USACE) Wetlands Delineation Manual (USACE 1987) as required by the USACE for use in the Section 404 of the Clean Water Act permitting process, as well as the Cowardin methodology required by the NPS (ASGEC 2008).

The abovementioned delineation identified wetlands that are classified according to USFWS, Cowardin et al. (1979) as palustrine and riverine systems. Of the 2.19 acres of wetlands being impacted by the construction of the multi-use trail, 1.80 acres of wetlands were classified as Palustrine Forested Broad-leaved Deciduous Wetland (PFO1), 0.34 of an acre was classified as Palustrine Emergent Persistent Wetland (PEM), and 0.05 of an acre was classified as Riverine Lower Perennial Emergent Non-Persistent Wetland (R2EM2). Sheets No. D1-D5 of the FHWA Location Maps in Appendix A illustrate the location of the trail relative to the delineated wetlands. According to the delineation report, palustrine wetland areas exhibited ponding and saturated soil to the surface in most instances. Field indicators of long-term hydrology within the wetlands included water-stained leaves, oxidized root channels, water marks on trees, sediment deposits, drainage patterns, inundation, and saturation, as well as morphological features, such as fluted and buttressed trunks (ASGEC 2008). Wetlands were located in topographical depressions or along open water in Hanging Moss Creek and two unnamed streams.

The FHWA Location Maps are 95% complete and are subject to change. They have not yet been finalized for construction.

Functions and values

This section describes the functions and values of typical Palustrine Forested Broad-leaved Deciduous Wetlands, Palustrine Emergent Persistent Wetlands, and Riverine Lower Perennial Emergent Non-Persistent Wetlands.

The vegetation in the project area was described as part of the Wetland Delineation Report (ASGEC 2008). There have not been any fish or wildlife surveys in the project area. The fish and wildlife described below are species that are known to occur along portions of the NATR (Accipiter Biological Consultants [ABC] 2001a; ABC 2001b; NPS 2007b and NPS 2007c) and potentially occur in the project area based on the natural history of the species and scientific literature.

Palustrine System

The palustrine system (Figure 3) includes all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 parts per thousand. The palustrine system was developed to group the vegetated wetlands traditionally called by such names as marsh, swamp, bog, fen, and prairie, which are found throughout the United States. It also includes the small, shallow, permanent or intermittent water bodies often called ponds. Palustrine wetlands may be situated shoreward of lakes, river channels, or estuaries; on river floodplains; in isolated catchments; or on slopes. They may also occur as islands in lakes or rivers. The erosive forces of wind and water are of minor importance except during severe flood (USFWS, Cowardin et al. 1979).

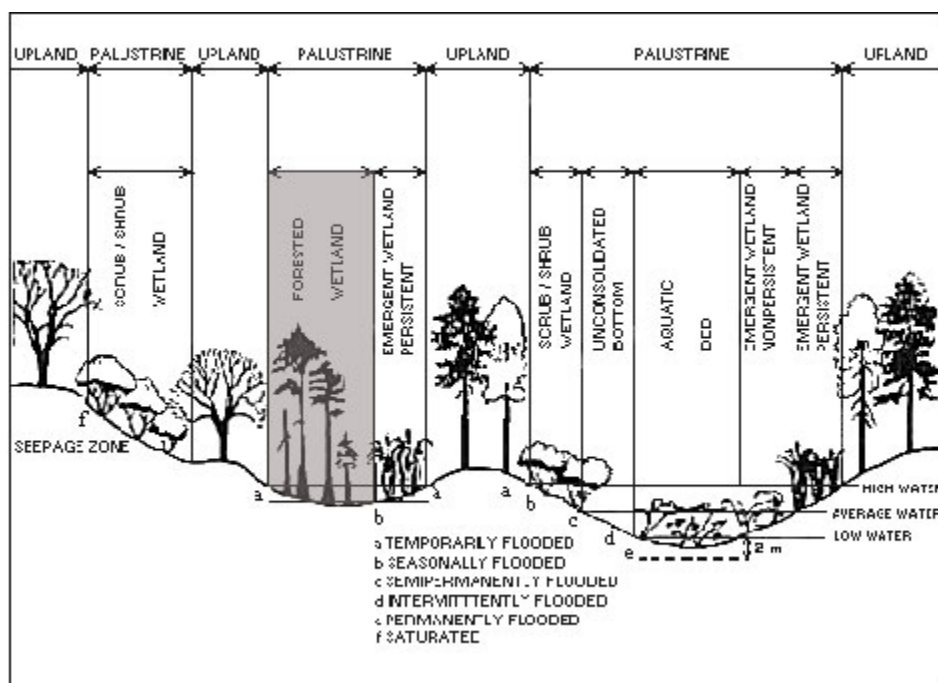


Figure 3. A palustrine forested broad-leaved deciduous wetland (USFWS, Cowardin et al. 1979).

A Palustrine Forested Broad-leaved Deciduous Wetland (Figure 3) may be saturated or temporarily or seasonally flooded. Saturated means that the substrate is saturated to the surface for extended periods during the growing season, but surface water is seldom present. Temporarily flooded means that surface water is present for brief periods during the growing season, but the water table usually lies well below the soil surface for most of the season. Plants that grow both in uplands and wetlands are characteristic of the temporarily flooded regime. Seasonally flooded means that surface water is present for extended periods, especially early in the growing season, but is absent by the end of the season in most years. When surface water is absent, the water table is often near the land surface (USFWS, Cowardin et al. 1979). For ease of reading the term Palustrine Forested Broad-leaved Deciduous Wetland will be shortened to Palustrine Forested Wetland.

Palustrine Forested Wetlands are characterized by woody vegetation that is 6 m (20 feet) tall or taller. Forested wetlands usually possess an overstory of trees, an understory of young trees or shrubs, and an herbaceous layer. In the project area, the overstory of the forested wetlands is dominated by broad-leaved deciduous trees, such as sweet gum (*Liquidambar styraciflua*), water oak (*Quercus nigra*), American sycamore (*Platanus occidentalis*), sugarberry (*Celtis laevigata*), boxelder (*Acer negundo*), and American elm (*Ulmus americana*). Sweet gum, American elm, boxelder, sugarberry, winged elm (*Ulmus alata*), and water oak dominate the woody understory. The shrub layer is dominated by Chinese privet (*Ligustrum sinense*), devil's walking stick (*Aralia spinosa*), and inkberry (*Ilex glabra*). The woody vine layer is dominated by red raspberry (*Rubus strigosus*) and other variations of raspberry species (*Rubus* spp.), Japanese honeysuckle (*Lonicera japonica*), and grape species (*Vitis* spp.). The herbaceous layer is dominated by soft rush (*Juncus effuses*), sensitive fern (*Onoclea sensibilis*), Japanese honeysuckle, river birch seedlings (*Betula nigra*), and water oak seedlings (ASGEC 2008).

Palustrine Forested Wetlands, also known as bottomland hardwood forests, provide wildlife habitat in their overstory, understory, and also on the forest floor where small depressions may form as a result of flood water scouring and sediment deposition. Bottomland hardwood forests provide important breeding habitat for a variety of migratory and resident bird species. High water levels may provide high quality habitat for wintering waterfowl, yet diminish habitat suitability for numerous woodpeckers and other woodland species. During periods of low water levels, bottomland hardwoods may be utilized by several wading birds, including the great blue heron (*Ardea herodias*) and the white ibis (*Eudocimus albus*), and acorn-caching species, such as the redheaded woodpecker (*Melanerpes erythrocephalus*) (USACE 2001).

Monitoring of spring migrants using WSR-88D doppler radar along the Gulf Coast has shown that migrants frequently land in bottomland forests along river systems upon arrival and depart these areas during early morning hours (Gathreaux 1999). Often, migrating birds will fly over coastal areas and land inland along forested river systems. If birds are using river systems as landmarks, then associated forested habitats along rivers may be vital for a successful migration for many species. Examples of species found during migration in bottomland forests include black-throated blue warblers (*Dendroica caerulescens*), American redstarts (*Setophaga ruticilla*), Baltimore orioles (*Icterus balbula*), and black-throated green warblers (*Dendroica virens*) (USACE 2001).

Southern bottomland hardwood forests also support a diverse array of nearctic migrants and year-round resident birds during the winter months (USACE 2001). Nearctic migrants account for about 55 percent of the bird community in southern bottomland hardwood forests. Residents and occasional transient species comprise the rest of the community (Dickson 1978). Typical nearctic species in southern bottomland hardwood forests include the ruby-crowned kinglet (*Regulus satrapa*), yellow-rumped warbler (*Dendroica coronata*), white-throated sparrow (*Zonotrichia albicollis*), brown creeper (*Certhia americana*), and yellow-bellied sapsucker (*Sphyrapicus varius*) (USACE 2001), almost all of which are known to occur on the NATR (ABC 2001a) and potentially occur in the project area. During high water levels, bottomland hardwoods may also support many wintering waterfowl species, including the wood duck (*Aix sponsa*), mallard (*Anas platyrhynchos*), and hooded merganser (*Lophodytes cucullatus*) (USACE 2001).

Southern bottomland hardwood forests also support numerous species of year-round resident birds. Year-round resident species comprise about 35 to 55 percent of seasonal bird communities (Dickson 1978; Zeller and Collazo 1995). Common southern bottomland hardwood forest resident species are the white-breasted nuthatch (*Sitta carolinensis*), the pileated woodpecker (*Dryocopus pileatus*), the downy woodpecker (*Picoides pubescens*), the red-bellied woodpecker (*Melanerpes carolinus*), the tufted titmouse (*Baeolophus bicolor*), Carolina wren (*Thryothorus ludovicianus*), and Carolina chickadee (*Poecile carolinensis*) (USACE 2001), all of which are known to occur on the NATR (ABC 2001a) and potentially occur in the project area.

Southern bottomland hardwood forests are renowned for supporting large numbers of breeding bird species. During the breeding season, the number of neotropical migrants breeding in these habitats ranges from 48 to 65 percent of the total breeding bird assemblage (U.S. Forest Service [USFS], Pashley and Barrow 1992). While many resident and wintering species are found in a variety of forested habitats, many breeding species either breed exclusively in bottomland forests or have highest densities and/or reproductive success in these areas. Several species are considered forested wetland specialists, including the prothonotary warbler (*Protonotaria citrea*) and the swallow-tailed kite (*Elanoides forficatus*) (Meyer 1995, Petit 1999). The prothonotary warbler is known to occur on the NATR (ABC 2001a) and potentially occurs in the project area. One of the most common neotropical migrants, the Acadian flycatcher (*Empidonax vireescens*), is largely restricted to forested wetland habitats during the breeding season in the Southeast (USACE 2001). A species of warbler known to occur on the NATR (ABC 2001a) and potentially occurring in the project area, showing sharp declines throughout its range during the past few decades is the Cerulean warbler (*Dendroica cerulea*). This warbler achieves highest densities and reproductive success in bottomland forests in the Southeast (USACE 2001). Seasonally flooded areas are often characterized by the presence of five species, the eastern wood-pewee (*Contopus virens*), great-crested flycatcher (*Myiarchus crinitus*), yellow-throated vireo (*Vireo flavifrons*), blue-gray gnatcatcher (*Polioptila californicus*), and prothonotary warbler (USFS, Pashley and Barrow 1992); all of which are known to occur on the NATR (ABC 2001a) and potentially occur in the project area.

The Avifauna Inventory (ABC 2001a) and Reptile and Amphibian Inventory (ABC 2001b) studies included two general habitat types, the bottomland hardwood woodland habitat type and the riparian woodland habitat type, which are considered to be part of the bottomland hardwood designation used above. Sixty-five species of birds were found in the bottomland hardwood general habitat, and 80 species of birds were found in the riparian woodland general habitat as part of the sampling for the Natchez Trace Parkway Avifauna Inventory Project (ABC 2001a). A list of species, including bird species, known to occur on the NATR and potentially occurring in the project area is provided in Appendix B.

Shallow depressions in bottomland hardwood forests, sometimes known as vernal ponds, seasonal, or temporary wetlands, can provide important habitat for amphibians. These depressions will often fill with water during the spring or fall and dry up during the remaining seasons. Fish are not able to become established due to the temporary nature of the wetland. This makes depressional habitat especially important as breeding and rearing habitat for not only amphibians, but also crustaceans and insects (USFS, Biebighauser 2003). Approximately one-half of all frogs and one-third of all salamander species rely on seasonal or temporary

wetlands for development (USFS, Biebighauser 2003). Three species of amphibians, the spring peeper (*Hyla crucifer*), the northern cricket frog (*Acris crepitans*), and the southern cricket frog (*Acris gryllus*), were found in the bottomland hardwood general habitat, and 12 species were found in the riparian woodland general habitat as part of the sampling for the Natchez Trace Parkway Amphibian and Reptile Inventory Project (ABC 2001b). A list of species, including amphibian species, known to occur on the NATR, (ABC 2001b) and potentially occurring in the project area is provided in Appendix B.

A complete list of reptiles known to occur on the NATR (ABC 2001b) and potentially occurring in the project area is provided in Appendix B.

Mammals occurring in the southern bottomland hardwood forests of Mississippi and potentially on the NATR include opossum (*Didelphis virginiana*), the swamp rabbit (*Sylvilagus aquaticus*), mink (*Mustela vison*), muskrat (*Ondatra zibethicus*), river otter (*Lutra canadensis*), and bats, such as the southeastern myotis (*Myotis austroriparius*), the little brown myotis (*Myotis lucifugus*), the gray myotis (*Myotis grisescens*), the northern yellow bat (*Lasiurus intermedius*), the Rafinesque's big-eared bat (*Corynorhinus rafinesquii*), the Hoary bat (*Lasiurus cinereus*), the northern myotis (*Myotis septentrionalis*), the Indiana myotis (*Myotis sodalis*) and the silver-haired bat (*Lasiurus noctivagans*) (Mississippi Museum of Natural Science [MMNS] 2005; NPS 2007b). Many of the bats are on the State of Mississippi's Species of Greatest Conservation Need list (MMNS 2005). A complete list of mammals potentially occurring on the NATR (NPS 2007c) and the project area is provided in Appendix B.

A Palustrine Emergent Persistent Wetland (Figure 4) may be characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants that remain standing at least until the beginning of the next growing season and include most water regimes. In areas with relatively stable climatic conditions, emergent wetlands maintain the same appearance year after year. In other areas, violent climatic fluctuations cause them to revert to an open water phase in some years (Steward and Kantrud 1972). Emergent wetlands are found throughout the United States and occur in all systems except the marine. Water depth in the deepest part of the basin is usually less than 2 meters at low water. Emergent wetlands are known by many names, including marsh, meadow, fen, prairie pothole, and slough. Persistent emergent wetlands are dominated by species that normally remain standing at least until the beginning of the next growing season (USFWS, Cowardin et al. 1979). For ease of reading the term Palustrine Emergent Persistent Wetland will be shortened to Palustrine Emergent Wetland.

Palustrine Emergent Wetlands provide habitat for many species of fish and wildlife. Many wading birds, such as herons and egrets are known to occur on the NATR and potentially occur in the Palustrine Emergent Wetlands in the project area. Migratory and resident waterfowl may also use this type of wetland during migration or the breeding season.

A complete list of bird species known to occur on the NATR (ABC 2001a) and potentially occurring in the project area is provided in Appendix B.

Thirty-one species of reptiles and amphibians were identified as occurring in Palustrine Emergent Wetlands on the NATR (ABC 2001b). Some of the more common amphibians include

the southern leopard frog, the green frog (*Rana clamitans*), bronze frog (*Rana clamitans clamitans*), the northern cricket frog, and the red-spotted newt (*Notophthalmus viridescens viridescens*). Some of the more common reptiles found in this type of wetland include the red-eared slider (*Trachemys scripta elegans*), the chicken turtle (*Deirochelys reticularia*), the common snapping turtle (*Chelydra serpentina*), and the eastern mud turtle (*Kinosternon subrubrum subrubrum*). A complete list of reptile and amphibian species known to occur on the NATR (ABC 2001b) and potentially occurring in the project area is provided in Appendix B.

No federally or state listed threatened or endangered species are known to occur in the project area.

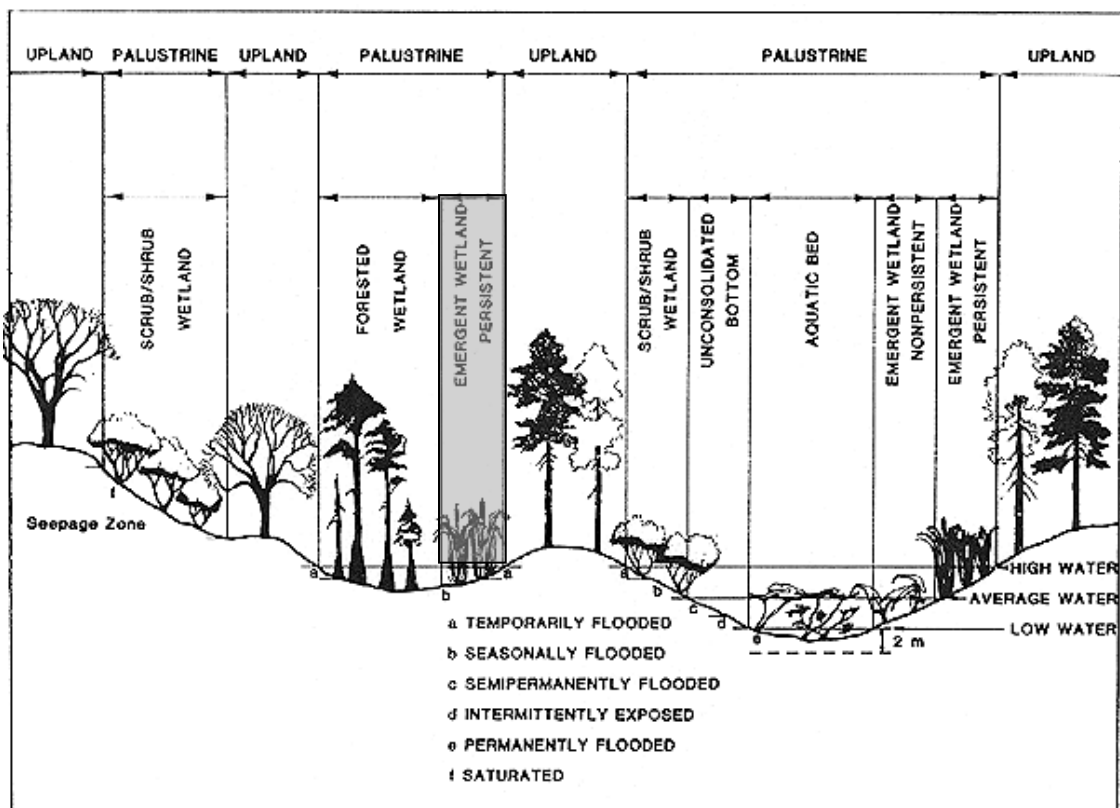


Figure 4. A Palustrine Emergent Persistent Wetland (USFWS, Cowardin et al. 1979).

Riverine System

The riverine system (Figure 5) includes all wetlands and deepwater habitats contained within a channel, with two exceptions: (1) wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens, and (2) habitats with water containing ocean-derived salts in excess of 0.5 parts per thousand (USFWS, Cowardin et al. 1979). A channel is “an open conduit either naturally or artificially created which periodically or continuously contains moving water or which performs a connecting link between two bodies of standing water” (USGS, Langbein

and Iseri 1960). Water is usually, but not always, flowing in the riverine system (USFWS, Cowardin et al. 1979).

A Riverine Emergent Perennial Non-Persistent Wetland is semipermanently flooded, which means that surface water persists throughout the growing season in most years. When surface water is absent, the water table is usually near the land surface. Herbaceous hydrophytic vegetation is usually present for most of the growing season. Intermittent wetlands are dominated by plants which fall to the surface of the substrate or below the surface of the water at the end of the growing season so that, at certain seasons of the year, there is no obvious sign of emergent vegetation. The dominant vegetation in the project area Riverine Emergent Perennial Non-Persistent Wetlands were spring cress (*Nasturtium officinale*), vetch spp. (*Vicia* spp.), sedge spp., soft rush (*Juncus effuses*), and maintained grasses (ASGEC 2008). For ease of reading the term Riverine Emergent Perennial Non-Persistent Wetland will be shortened to Riverine Emergent Wetland.

Like Palustrine Emergent Wetlands, Riverine Emergent Wetlands provide habitat for many species of fish and wildlife. Many wading birds, such as herons and egrets are known to occur on the NATR and potentially occur in the Riverine Emergent Wetlands in the project area. Migratory and resident waterfowl may also use this type of wetland during migration or the breeding season.

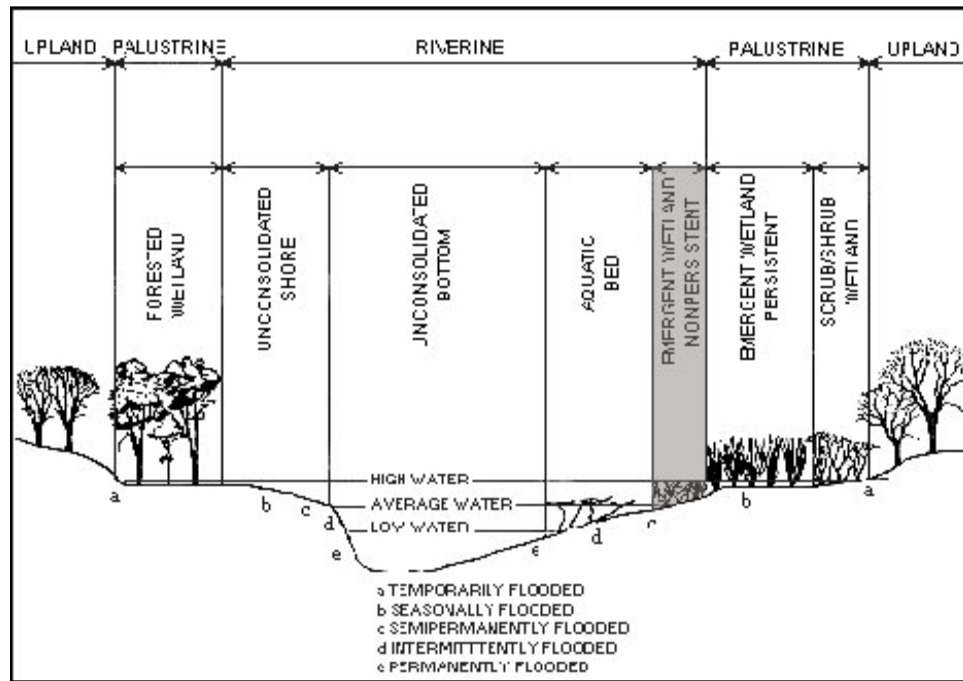


Figure 5. A Riverine Emergent Wetland (USFWS, Cowardin et al. 1979).

A complete list of bird species known to occur on the NATR (ABC 2001a) and potentially occurring in the project area is provided in Appendix B.

Thirty-one species of reptiles and amphibians were identified as occurring in Riverine Emergent Wetlands on the NATR (ABC 2001b). Some of the more common amphibians include the southern leopard frog, the green frog (*Rana clamitans*), bronze frog (*Rana clamitans clamitans*), the northern cricket frog, and the red-spotted newt (*Notophthalmus viridescens viridescens*). Some of the more common reptiles found in this type of wetland include the red-eared slider (*Trachemys scripta elegans*), the chicken turtle (*Deirochelys reticularia*), the common snapping turtle (*Chelydra serpentina*), and the eastern mud turtle (*Kinosternon subrubrum subrubrum*). A complete list of reptile and amphibian species known to occur on the NATR (ABC 2001b) and potentially occurring in the project area is provided in Appendix B.

Riverine Emergent Wetlands provide fish spawning and nursery habitat for species, such as small-mouth bass (*Micropterus dolomieu*), large-mouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), and the common carp (*Cyprinus carpio*). A complete list of fish species known to occur on the NATR (NPS 2007b) and potentially occurring in the project area is provided in Appendix B.

No federally or state listed threatened or endangered species are known to occur in the project area.

The abovementioned wetlands, the Palustrine Forested Wetlands, the Riverine Emergent Wetlands, and the Palustrine Emergent Wetlands, also provide flood storage, reduce flood flows and the velocity of flood waters, reducing erosion and causing flood waters to release sediment. These types of wetlands also aid in nutrient trapping and groundwater recharge/discharge. Wetland vegetation, especially the vegetation in Riverine Emergent and Palustrine Emergent Wetlands, filters out pollutants from the water, while microorganisms utilize nutrients and break down organic matter, improving water quality. Insects living in the substrate and vegetation of the wetlands are the basis of the food chain for the abovementioned wildlife and fish species. Generally, these types of wetlands also serve as recreation areas for hunting, fishing, and wildlife observation and are economically important to local communities as a source of ecotourism and subsistence.

Locally, the wetlands along this relatively narrow (approximately 800 feet wide) urban section of the NATR have been impacted by development and have limited access, so they no longer provide many recreational opportunities. Hunting is not allowed in the park. Constructing the multi-use trail will enable the increased use of these wetlands for wildlife and nature observation. The trail will provide opportunities for recreation primarily in the form of bicycling and walking. No motorized vehicles other than authorized maintenance or emergency vehicles will be allowed on the trail.

The wetlands in the project area are heavily impacted by urban development, directly by the construction of roads and housing developments or indirectly through the change in hydrology from water diversion associated with this urban development. This development has also aided in the isolation and fragmentation of these wetlands. As a result, the abovementioned functions and values of these wetlands have been degraded.

Avoidance and Minimization

The NPS in cooperation with the FHWA is proposing to design and construct approximately 2.05 miles of multi-use trail from milepost 95.8 to 200 feet west of Livingston Road (approximate

milepost 97.85) within the NATR motor road right of way. Design emphasis has been to avoid and minimize impacts to wetland resources. Approximately 2.19 acres of wetlands will be impacted by trail construction. The abundance of wetland resources on both sides of the NATR motor road precludes the complete avoidance of impacts to wetlands. Impacts will include the filling in of wetlands, removal and injury to wetland vegetation, and hydrological changes to wetlands. These impacts are described in more detail below.

The trail begins at milepost 95.8 near Jackson, Mississippi (Figure 2). The trail alignment travels east midway between the NATR motor road and the NATR boundary until it crosses Hanging Moss Creek. Hanging Moss Creek flows from beyond the northern NATR boundary south through an existing culvert underneath the NATR motor road. Forested uplands surround the stream corridor, but are not flooded frequently enough to be characterized as forested wetlands. One double 8-foot span, 8-foot rise concrete box culvert will be installed at this location, impacting 0.03 of an acre of Riverine Emergent Wetland from approximately Station 52+85 to 53+06. The installation of the box culvert would permanently remove riverine emergent vegetation and compact wetland soils in the construction footprint. Construction activities on the stream bank would temporarily increase sedimentation in the stream and the riverine emergent wetlands downstream of the new box culvert, which would also impact aquatic organisms, such as insects, fish and wildlife, using the stream and streambank. See Sheet No. D1 of the FHWA Location Map Sheets in Appendix A.

The trail alignment travels east and will intersect Palustrine Emergent Wetlands from Station 58+56 to 61+97. These wetlands extend beyond the northern NATR boundary into linear, temporarily flooded forested wetlands. Hydrology of this wetland is influenced by runoff from adjacent uplands and by a concrete drainage feature that discharges stormwater runoff from the NATR motor road. This area was an artificially created stock pond at one time with a large earthen dam approximately 75 feet from the north edge of the NATR motor road. The earthen dam was removed in 1996 during NATR motor road construction. The trail alignment will impact approximately 0.34 of an acre of Palustrine Emergent Wetlands and will fill in part of the wetland, impacting vegetation, soils, and hydrology beneath the trail. The trail will also interrupt wetland hydrology by bisecting the wetland. Construction activities will impact the wetland adjacent to the trail, disturbing wetland vegetation and compacting wetland soils. These impacts to wetland vegetation, soils, and hydrology will adversely impact wildlife, permanently because of the loss of wetland habitat beneath the trail as well as temporarily because of construction impacts described above adjacent to the trail and construction noise disturbance. Wildlife potentially occurring in Palustrine Emergent Wetlands and potentially adversely impacted by construction activities is described above. To minimize these wetland impacts, effort was made to bisect the wetland in the narrowest part of the wetland between the NATR motor road and the NATR boundary yet also allow a buffer between the trail and the NATR motor road. A 36-inch culvert will also be installed in the Palustrine Emergent Wetland intersecting the trail at approximately Station 59+44 and will facilitate water flow past the trail and ensure a hydrological connection between wetlands on both sides of the trail. See Sheet No. D1 of the FHWA Location Map Sheets in Appendix A.

The trail will continue a short distance east and will intersect Palustrine Forested Wetland from Station 62+58 to Station 62+77 impacting approximately 0.01 of an acre of Palustrine Forested

Wetland. This wetland is also influenced by runoff from adjacent uplands and by a concrete drainage feature that discharges stormwater runoff from the NATR motor road. The impacts would be the same as those mentioned above for Palustrine Emergent Wetlands. Wildlife potentially occurring in Palustrine Forested Wetlands and potentially adversely impacted by construction activities is described above. See Sheet No. D1 of the FHWA Location Map Sheets in Appendix A.

The trail will travel east through non-wetlands on Sheet No. D2 of the FHWA Location Map Sheets in Appendix A and will eventually intersect Palustrine Forested Wetlands from Station 122+14 to Station 124+74 impacting approximately 0.27 of an acre. This wetland extends north beyond the NATR boundary and has an intermittent stream corridor. Water in this stream corridor flows south through a culvert and continues underneath the NATR motor road. Hydrology within this wetland is supported by several other factors; including runoff from adjacent uplands, stormwater runoff from a concrete drainage feature and groundwater seeps. One 10-foot span, 6-foot rise concrete box culvert will be installed in the intermittent stream corridor in the Palustrine Forested Wetlands intersecting the trail from approximately Station 124+50 to Station 124+60. The installation of the box culvert will permanently remove palustrine forest vegetation and compact wetland soils in the construction footprint. Construction activities on the stream bank may temporarily increase sedimentation in the intermittent stream and the Palustrine Forested Wetlands downstream of the new box culvert, which would also impact aquatic organisms, such as insects, fish and wildlife, using the stream and streambank. See Sheet No. D3 of the FHWA Location Map Sheets in Appendix A.

The trail will travel a short distance and intersect Palustrine Forested Wetlands from Station 125+06 to Station 126+57, impacting 0.15 of an acre. The trail will travel a short distance more and intersect Palustrine Forested Wetlands from Station 127+29 to Station 127+59, impacting 0.01 of an acre. The impacts to the described Palustrine Forested Wetlands would be the same as those mentioned above for Palustrine Emergent Wetlands. Wildlife potentially occurring in Palustrine Forested Wetlands and potentially adversely impacted by construction activities is described above. See Sheet No. D3 of the FHWA Location Map Sheets in Appendix A.

The trail will travel east and will intersect Palustrine Forested Wetlands from Station 129+84 to Station 132+80 impacting approximately 0.18 of an acre. This wetland is supported by groundwater seepage, temporary flooding by the stream located from approximately Station 134+00 to Station 134+40, and stormwater runoff from both the NATR motor road and Rouser Road located to the north of the NATR motor road. A 24-inch culvert will be installed at approximately Station 132+00 and will minimize impacts to hydrology as well as ensure drainage past the trail. The impacts to the described Palustrine Forested Wetlands would be the same as those mentioned above for Palustrine Emergent Wetlands. Wildlife potentially occurring in Palustrine Forested Wetlands and potentially adversely impacted by construction activities is described above. See Sheet No. D4 of the FHWA Location Map Sheets in Appendix A.

The trail will travel east and cross an unnamed tributary from Station 133+91 to Station 134+31, impacting 0.03 of an acre of Riverine Emergent Wetland. Hydrology of this wetland complex is supported by groundwater seepage, flow within the stream corridor, several outfalls, and stormwater runoff from both the NATR motor road and Rouser Road located to the north of the

NATR motor road. The installation of the double 10-foot span, 6-foot rise concrete box culvert at approximately Station 134+15 would permanently remove riverine emergent vegetation and compact wetland soils in the construction footprint. Construction activities on the stream bank would temporarily increase sedimentation in the stream and the riverine emergent wetlands downstream of the new box culvert, which would also impact aquatic organisms, such as insects, fish and wildlife, using the stream and streambank. See Sheet No. D4 of the FHWA Location Map Sheets in Appendix A.

The trail will travel east and will intersect Palustrine Forested Wetlands from Station 141+26 to Station 154+90 impacting approximately 1.18 acres. Hydrology of this wetland is supported by groundwater seepage, temporary flooding by the stream, and stormwater runoff from both the NATR motor road and Rouser Road located to the north of the NATR motor road. The impacts to the described Palustrine Forested Wetlands would be the same as those mentioned above for Palustrine Emergent Wetlands. Wildlife potentially occurring in Palustrine Forested Wetlands and potentially adversely impacted by construction activities is described above. A double 24-inch culvert at approximately Station 141+26, another 24-inch culvert at approximately Station 144+50, and a 24-inch culvert at approximately Station 148+60 will be installed in the Palustrine Forested Wetlands intersecting the trail from approximately Station 141+26 to Station 154+90 and will facilitate water flow past the trail and ensure a hydrological connection between wetlands on both sides of the trail. See Sheet No. D4 of the FHWA Location Map Sheets in Appendix A.

The trail will travel east through the Palustrine Forested Wetlands from Station 141+26 to Station 154+90. An 18-inch culvert will be installed at approximately Station 154+20 to facilitate water flow past the trail. See Sheet No. D5 of the FHWA Location Map Sheets in Appendix A.

The multi-use trail profile will closely match the existing ground elevations. The typical section of the multi-use trail will have a 10-foot wide paved travel surface with 2-foot wide unpaved shoulders. The trail will be constructed on compacted fill, including an aggregate base to existing ground or 24-inch depth minimum, which includes a cement-treated sub-base approximately 6 inches deep. This will be topped with a layer of Super Pave asphalt concrete pavement approximately 3 inches deep. A drawing of a typical section of the multi-use trail is included in Appendix A.

Using a more porous fill through the wetland areas to facilitate wetland connectivity was discussed by the interdisciplinary team (IDT) working on this project. It was determined that the porous fill will not be appropriate in this project due to the following reasons:

- The impacted wetlands are primarily underlain by expansive Yazoo clay. The porous rock fill would require a greater height and width of the overall trail footprint than the current trail design and engineering to prevent shrink-swell of the clay from quickly damaging the trail pavement.
- The porosity of the rock fill, even if encased in filter fabric, would be compromised quickly by fallen leaves, silt, and organic matter.
- There are no appropriate rock sources located within a reasonable and cost effective distance from the project area. Therefore, importing rock would add significant expense.

- Construction and maintenance of the rock fill would be more difficult and expensive than for a paved trail with adequate culverts.
- Implementing porous fill and culverts as illustrated in Figure 40, page 37 from *Managing Roads for Wet Meadow Ecosystem Recovery* would be contrary to the desired natural “laid lightly on the land” visual character, the NPS mission and the multi-use trail overall design character.
- Additional oversized culverts have been specified in the current trail design where appropriate to facilitate natural drainage and prevent downstream incision.

The use of boardwalks to facilitate wetland connectivity was also considered. It was determined that boardwalks will not be appropriate for this project due to the following reasons:

- Boardwalks would need to be 14 feet wide based on the 10-foot trail width and would need to be designed to accommodate maintenance and emergency vehicles. This would be very expensive to construct and maintain, since it would essentially be one long bridge. Elevated boardwalks (Director’s Order 77-1 – Best Management Practices 2002) [DO-77-1 BMP’s] recommend the same height as width – 14 feet high) would result in the construction of a bridge that would be incompatible with NATR aesthetics. This structure would require enormous approach fills, especially to maintain the five percent accessible grade. Supports for an elevated boardwalk/bridge would have to be very deep to withstand shifting and damage from expansive clay soils. Approach fills and deeply driven piles with spread footings would significantly increase construction and maintenance costs and would severely impact existing wetlands during construction.
- Low boardwalks may be more aesthetically pleasing than elevated boardwalks; however, they would experience the same clogging problem as the porous rock fill due to fallen leaves, heavy silt, and woody and other debris. Boardwalk surfaces made of wood or plastic can be slippery when wet increasing the potential for safety problems.
- Maintenance would be more difficult and expensive than for a paved trail with adequate culverts.
- Implementing boardwalks as per the DO-77-1 BMP’s (NPS 2002) would be contrary to the desired natural “laid lightly on the land” visual character, the NPS mission and the multi-use trail overall design character and the visual quality of the NATR.
- Additional oversized culverts have been specified in the current trail design where appropriate to facilitate natural drainage and prevent downstream incision.

Adverse impacts to wetlands will be minimized during and after construction by implementing an erosion control plan, which calls for the use of temporary erosion control devices and permanent erosion control devices, such as filter fabric and loose riprap at culvert ends, and check dams with erosion control mats to minimize erosion and facilitate revegetation at needed locations. Following trail construction through wetland areas, disturbed ground between the toe of the slope and the adjacent forest will be re-seeded and/or re-planted with a mixture of native herbaceous, hydrophytic species, such as rushes (*Juncus* sp.) and sedges (*Carex* sp.), in order to help facilitate wetland restoration. Trail shoulders and side slopes will be planted with a park preferred seed mix to control erosion.

The majority of the wetlands appear to have been formed by water overflowing the banks of flat graded, narrow streams and then lying on the flat overbank floodplains for extended periods of time. Hanging Moss Creek and the unnamed streams rise and fall gradually as flood events occur. The trail crosses these streams and other minor tributaries perpendicularly, so that flow rises out of and recedes back into the streams at the same rate on both sides of the trail without the need to cross underneath the trail thru a culvert. However, culverts will also be installed where appropriate to facilitate natural drainage and prevent downstream incision.

Some of the wetland areas located farther away from the large streams will be crossed by the trail such that the potential exists for water to collect in “pockets” behind one side of the trail as flood waters recede. Flat graded 18-inch to 24-inch diameter culverts will be placed in these areas to allow water levels to recede naturally. For most cases, the headwater depths of ponded water trapped in these pockets, e.g. Station 132+00, do not exceed 2 to 3 feet and outlet velocities will be reduced by stabilizing the culvert outlet with riprap. During large springtime flood events, when streambanks are overtopped and the floodwaters are slowly receding, relatively high tailwater will be acting on these culverts as well, further reducing/controlling the outlet velocities.

NATR staff has noted that channel improvements and downstream urban development outside of the Natchez Trace Parkway boundaries may have substantial impacts on the frequency and extent of overbank flooding on Hanging Moss Creek and the two unnamed streams. This narrow section of the NATR bisects two of the most heavily developed and dynamic urban areas of Mississippi. The storm water impacts across this narrow section of the NATR are heavily influenced by the management practices of the surrounding municipalities, the developmental history of the adjacent lands, and the existing footprint of the NATR motor road and trail. Urban development impacts, which are outside the park’s control, may have the most substantial impacts on the future health of wetlands within the park.

The FHWA Location Maps are 95% complete and are subject to change. The plans have not yet been finalized for construction.

Mitigation

Design emphasis has been to avoid and minimize impacts to wetland resources. Approximately 2.19 acres of wetlands will be impacted by trail construction – 1.80 acres of which are Palustrine Forested Wetland, 0.05 of an acre of which are Riverine Emergent Wetland, and 0.34 of an acre of which are Palustrine Emergent Wetland. The NPS will provide compensation through the restoration of approximately 4.38 acres of wetlands. The restored areas will be Palustrine Forested Wetland and Palustrine Emergent Wetland and will provide equivalent wetland functions to the Palustrine Forested Wetlands and Palustrine Emergent Wetlands being impacted by the project. These functions are described above.

In general, in-kind mitigation is preferable to out-of-kind mitigation because it is most likely to compensate for the functions and services lost at the impact site. However, in the case of the impacted Riverine Emergent Wetlands (0.05 of an acre) where the impacts are much less than those to Palustrine Forested Wetland and Palustrine Emergent Wetland, it was decided that additional Palustrine Emergent Wetland would adequately compensate for the lost functions and services of the 0.05 of an acre of Riverine Emergent Wetlands.

The Bogue Chitto Creek Wetland Mitigation Area (4.01 acres – Milepost 91.5) (Figure 6) is a newly purchased land parcel along Bogue Chitto Creek. It is a heterogeneous site with former building sites on fill, disturbed grassy open areas and shallow depressional areas, and manmade trenching and ditches. Common herbaceous species include sedges, rushes, panic grasses (*Dicanthelium* spp.), poison ivy (*Toxicodendron radicans*), and goldenrod species (*Solidago* spp.). Dominant woody vegetation includes young, shrubby black willow (*Salix nigra*), eastern baccharis (*Baccharis halimifolia*), boxelder, hackberry (*Celtis occidentalis*), and green ash (*Fraxinus pennsylvanica*). Some loblolly pine (*Pinus taeda*), oak (*Quercus* spp.), and hickory saplings (*Carya* spp.) can also be found. Mature species on site are largely composed of willow and boxelder.

The restoration will include the removal of fill areas and the expansion of depressional areas to make the topography consistent with the Palustrine Forested Wetlands northeast of the site. A variety of native species of trees (Table 1) known to occur in Palustrine Forested Wetlands along the NATR motor road will be planted at a density of 400 trees per acre to hasten restoration to a mature palustrine forested wetland with an interlocking canopy. Native herbaceous species, such as sedges and rushes will also be planted in the expanded depressional areas. Given time, the heavily degraded area will mature into a Palustrine Forested Wetland that is semi-permanently flooded.

Table 1. Native tree species found in Palustrine Forested Wetlands along the Natchez Trace Parkway.

Scientific Name	Common Name
<i>Acer rubrum</i>	Red maple
<i>Ulmus americana</i>	American elm
<i>Nyssa sylvatica</i>	Black gum
<i>Quercus falcata</i>	Southern red oak
<i>Quercus pagoda</i>	Cherrybark oak
<i>Fraxinus pennsylvanica</i>	Green ash
<i>Salix nigra</i>	Black willow

Hydrology of the wetlands will be improved by filling trenches and ditches and by the removal of soil to expose groundwater and allow for the development of palustrine emergent wetland vegetation. Palustrine emergent wetland vegetation, including rushes and sedges, will be planted in the depressional areas as appropriate to hasten the development of a mature palustrine emergent wetland.



2006 National Agriculture Imagery Mosaic by NRCS
Figure developed by Ginger Molitor, NPS-DSC 05/12/2010 P:\NATR\55898 FLHP\COMPLIANCE\enviro assesment\3P18\wetland SOF

Figure 6. Bogue Chitto Creek wetland mitigation area (Total = 4.01 Acres).

The Bogue Chitto North of Parkway Wetland Mitigation Area (0.37 of an acre) is currently being mowed to prevent hydrophytic vegetation from establishing, resulting in a degraded wetland condition (Figure 7). This 0.37 of an acre will be taken out of the mowing regime. The semi-permanent hydrology has prevented mowing except during periods of extended drought. Vegetation from the adjoining forested wetland will encroach and reestablish within the formerly mowed zone. As was described above, a variety of native species of trees (Table 1) known to occur in Palustrine Forested Wetlands along the NATR motor road will be planted at a density of 400 trees per acre to hasten restoration to a mature bottomland hardwood forest with an interlocking canopy. Given time, the heavily degraded area will mature into a Palustrine Forested Wetland that is semi-permanently flooded.

Mitigation Success Criteria

The mitigation will be considered successful if the following conditions are realized at the end of the 5-year monitoring program:

- Mitigation areas contain no more than 20 percent total cover by exotic and nuisance plant species,
- Hydrophytic vegetation has become established (60% survival rate),
- A mosaic of wetland and upland habitat with no less than 70 percent of the area supporting hydrophytic vegetation, and
- At least a 65 percent survival rate of native trees. To ensure survival of 65 percent, seedlings will be protected with biodegradable mesh tubes. Dead seedlings will also be replaced as needed through the 5-year restoration period.

On-Site Monitoring

Monitoring Methodology

Monitoring will be conducted for the restoration sites (Figures 6 and 7), beginning immediately after the restoration (after re-grading and planting of trees and vegetation), which will be designated as time-zero or the beginning of the restoration time period. Monitoring surveys will be done by qualified NATR personnel after the first growing season or approximately one year after planting to determine the survival of the plantings. If needed, supplemental planting will be done, and another monitoring survey will be done after the second growing season. By this time, plantings should be at the point where they are sustainable. A final monitoring survey will be done after the fifth growing season.

Status/documentation of vegetation, photographs, wildlife, and general weather will be documented at the restoration site. A time-zero post construction and planting (as-built conditions) report will document plant densities and describe the conditions of the restoration areas after restoration is completed in the one restoration area and after mowing is stopped in the right of way restoration area. The monitoring reports will document the progress of the restoration efforts and monitor the success of the plantings and natural species recruitment. All reports will be kept on file at NATR headquarters. Any issues that arise or corrective action that needs to be taken will also be included in the monitoring reports. Observations of vegetation will be made along fixed transects in both restoration sites to ensure identical sampling procedures throughout the time-zero and the subsequent reporting cycles.



2006 National Agriculture Imagery Mosaic by NRCS
Figure developed by Ginger Molitor, NPS-DSC 05/12/2010 P:\NATR\55898 FLHP\COMPLIANCE\enviro assesment\3P18\wetland SOF

Figure 7. Bogue Chitto Creek north of parkway wetland mitigation area (Total = 0.37 of an acre).

Wildlife Monitoring

During the monitoring program, observations of wildlife will be made in the restoration areas during monitoring surveys through both visual means and inspection of physical evidence.

Photographic Documentation

Photograph stations will be identified in the restoration areas. These locations will be used to document the physical condition of the restoration area during the five-year monitoring program.

Monitoring Reports

Monitoring reports will be prepared by the NATR. These reports will provide documentation of the success of the mitigation program and the general condition of the enhanced area.

Monitoring reports will consist of the following information:

- Narrative description of the enhancement activities performed since the last report,
- Explanation of maintenance work to be conducted over the next year,
- List of wildlife species observed,
- Results of vegetative monitoring,
- Photographs taken at photo station locations on compass points,
- General weather description, and
- Description of any remedial action recommendations (if necessary).

These reports will be submitted to the NATR Chief of Resources for review and filed at the NATR.

Long Term Maintenance

Annual inspections of the mitigation areas will occur for the five years of the monitoring program. The inspections will be performed by a qualified NATR ecologist. The mitigation site will be inspected and locations of exotic and/or nuisance species identified to be treated and removed. Notations will be made of any potential problems identified during the inspection. The site will be maintained continually to ensure exotics and nuisance species do not become the dominant vegetation in the mitigation areas. If necessary, the park will actively revegetate with native wetland species. Re-grading will begin in Fall/Winter 2010. The restoration will begin January-February 2011. It is estimated that it may take 15-20 years before a hardwood stand with a good canopy, providing the same functions and values of the impacted Palustrine Forested Wetlands, will be established. Palustrine Emergent Wetlands are estimated to be fully established, providing the same functions and values of the impacted Palustrine Emergent Wetlands, in 3-5 years.

Work Schedule Plan

The following work schedule, Table 2, outlines activities and dates for monitoring program execution:

Table 2. Work schedule plan.

MITIGATION ACTIVITY	DUE DATE
Re-grading of the site begins	Fall/Winter 2010
Restoration starts	January-February 2011
Time-zero monitoring report	April 2011
First monitoring report (after first growing season)	April 2012
Second monitoring report (after second growing season)	April 2013
No monitoring will be done after the third and fourth growing season	2014-2015
Final monitoring report (after fifth growing season)	April 2016

Justification for Use of Wetlands

The NPS proposes to construct a 2.05-mile long trail segment along the north side of the NATR motor road. This proposal is consistent with the 1987 Comprehensive Trail Plan (NPS 1987), Natchez Trace National Scenic Trail/Alabama-Mississippi-Tennessee, developed in conjunction with the NATR-GMP (NPS 1987), the 1995 Natchez Trace Parkway Multi-Use Trail Study Environmental Assessment (NPS 1995), and the 1999 Congressional Directive to the NPS directing the NATR to construct a multi-use trail in conjunction with the construction of the NATR motor road (U.S. Congress 1999). The NPS finds that there are no practicable alternatives to disturbing approximately 2.19 acres of wetlands along the alignment of a trail between approximately mileposts 95.8 to 97.85 of the NATR. Wetlands have been avoided to the maximum practicable extent, and the wetland impacts that could not be avoided will be minimized. Unavoidable impacts to wetlands will be compensated for at a ratio of approximately two to one (2:1), which is consistent with the NPS no-net-loss of wetlands policy.

Compliance

Clean Water Act Section 401 and Section 404, and National Pollution Discharge Elimination System (NPDES)

The proposed actions impact waters of the United States as defined by the Clean Water Act and are therefore subject to review by the USACE. Section 401 of the Clean Water Act is a certification by the state that the project impacts to water quality will not exceed the state's water quality standards. Section 404 of the Clean Water Act requires a permit for any activity which may result in the discharge of dredged or fill material into navigable waters. Therefore, Section 401 and Section 404, and NPDES permits will be required for this project. Section 401, Section 404, and NPDES permits will complete the requirements for federal and state permitting for this segment of the trail.

National Environmental Policy Act

The 1995 EA and FONSI, the Section 106 compliance review, a Floodplain SOF for Executive Order 11988, Floodplain Management, and this SOF for Executive Order 11990 will complete the requirements for the National Environmental Policy Act for this project.

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APPENDIX A

FHWA Location Maps

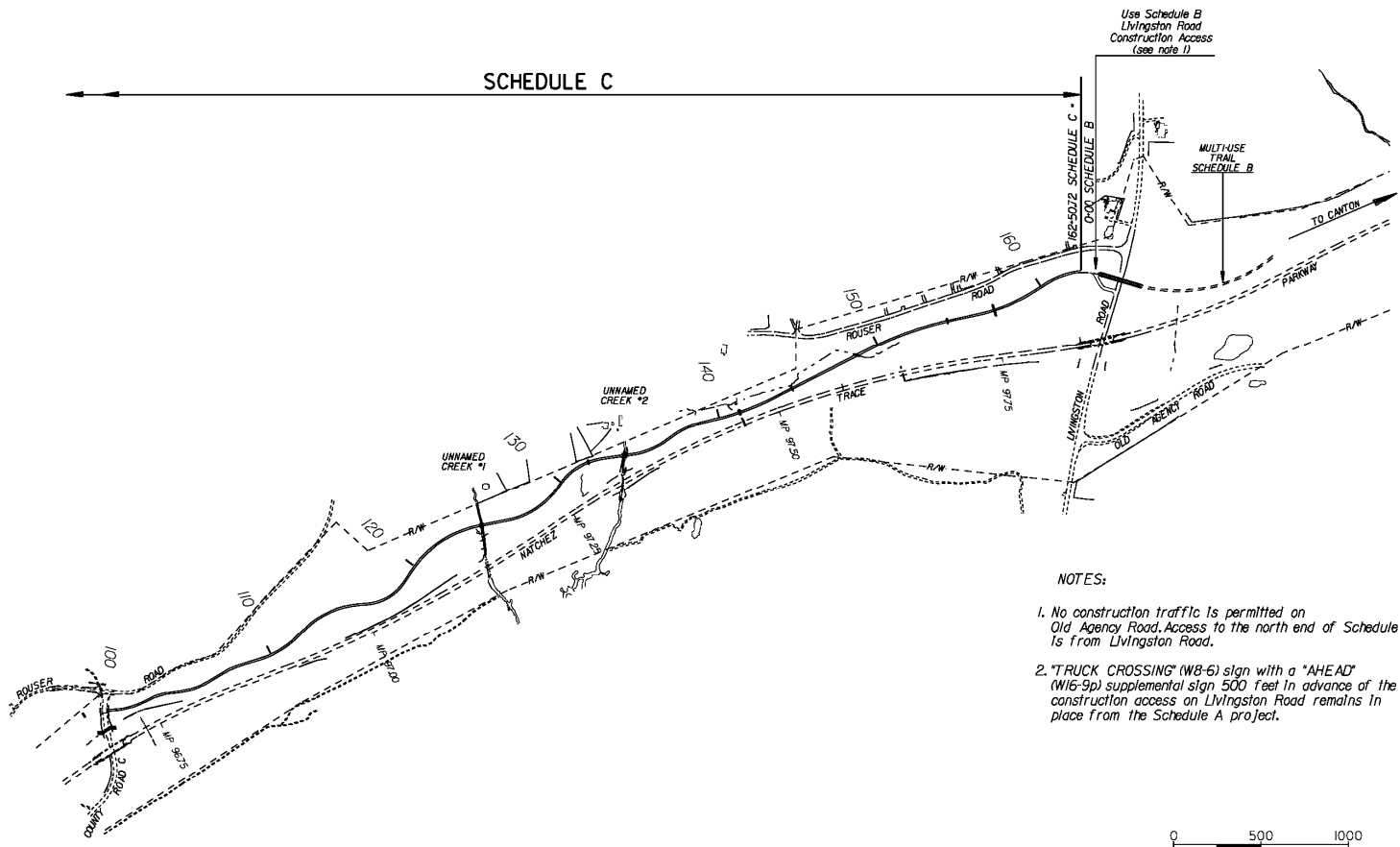
The FHWA Location Maps are 95% complete and subject to change. They have not yet been finalized for construction.

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PMIS NO.	NPS NO.	REG	STATE	PROJECT	SHEET NO.
55898	504 23959	SE	MS	PRA-NATR.3P17,18	A4



SCHEDULE C



NOTES:

1. No construction traffic is permitted on Old Agency Road. Access to the north end of Schedule C is from Livingston Road.
2. "TRUCK CROSSING" (W8-6) sign with a "AHEAD" (W16-9p) supplemental sign 500 feet in advance of the construction access on Livingston Road remains in place from the Schedule A project.



U.S. DEPARTMENT OF TRANSPORTATION
 FEDERAL HIGHWAY ADMINISTRATION
 EASTERN FEDERAL LANDS HIGHWAY DIVISION
 STERLING, VIRGINIA

**NATCHEZ TRACE PARKWAY
 LOCATION MAP
 (SCHEDULE C)**

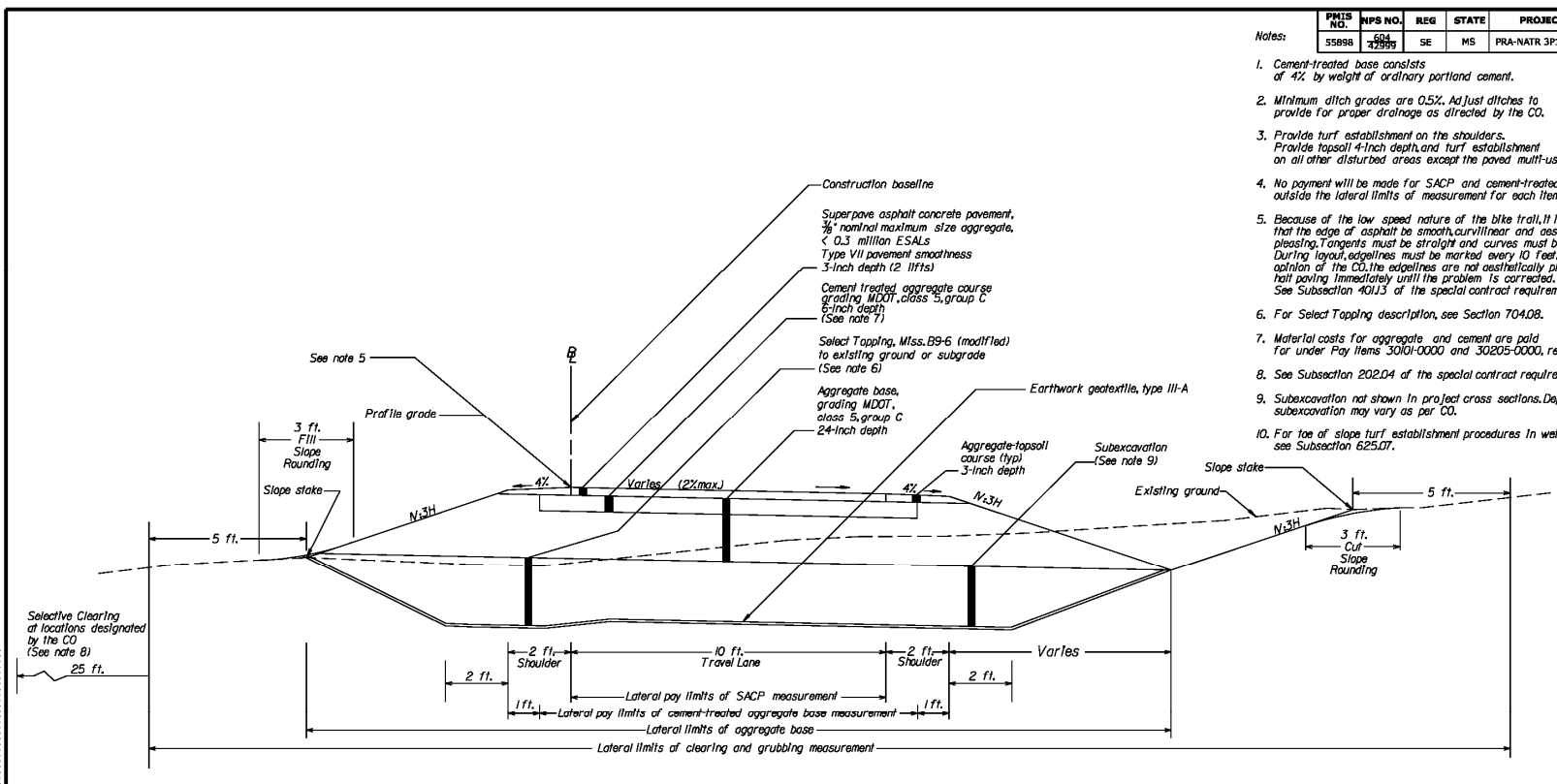
SHEET 2 OF 2

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PMIS NO.	WPS NO.	REG.	STATE	PROJECT	SHEET NO.
5588	64	SE	MS	PRA-NATR 3P17,18	A8

Notes:

- Cement-treated base consists of 4% by weight of ordinary portland cement.
- Minimum ditch grades are 0.5%. Adjust ditches to provide for proper drainage as directed by the CO.
- Provide turf establishment on the shoulders. Provide topsoil 4-inch depth, and turf establishment on all other disturbed areas except the paved multi-use trail.
- No payment will be made for SACP and cement-treated base outside the lateral limits of measurement for each item.
- Because of the low speed nature of the bike trail, it is critical that the edge of asphalt be smooth, curvilinear and aesthetically pleasing. Tangents must be straight and curves must be uniform. During layout, edgelines must be marked every 10 feet. If, in the opinion of the CO, the edgelines are not aesthetically pleasing, halt paving immediately until the problem is corrected. See Subsection 401.3 of the special contract requirements.
- For Select Tapping description, see Section 704.08.
- Material costs for aggregate and cement are paid for under Pay Items 30101-0000 and 30205-0000, respectively.
- See Subsection 202.04 of the special contract requirements.
- Subexcavation not shown in project cross sections. Depth of subexcavation may vary as per CO.
- For toe of slope turf establishment procedures in wetland areas, see Subsection 625.07.



MULTI-USE TRAIL
(50+00 to 162+57.13)



U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
EASTERN FEDERAL LANDS HIGHWAY DIVISION
STERLING, VIRGINIA

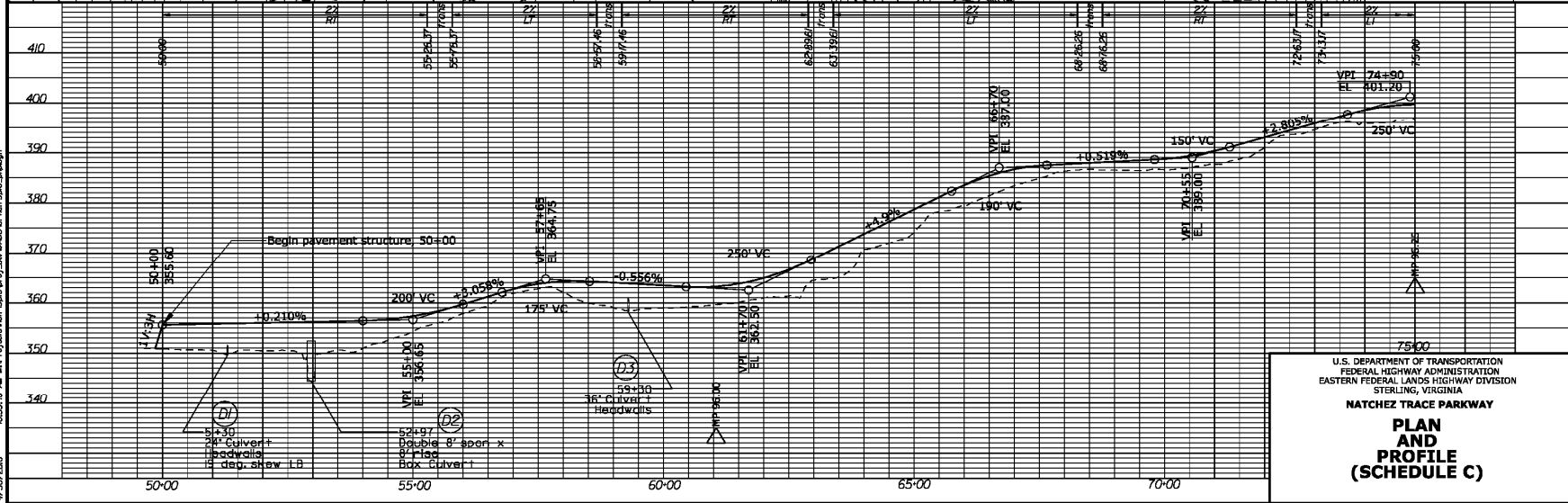
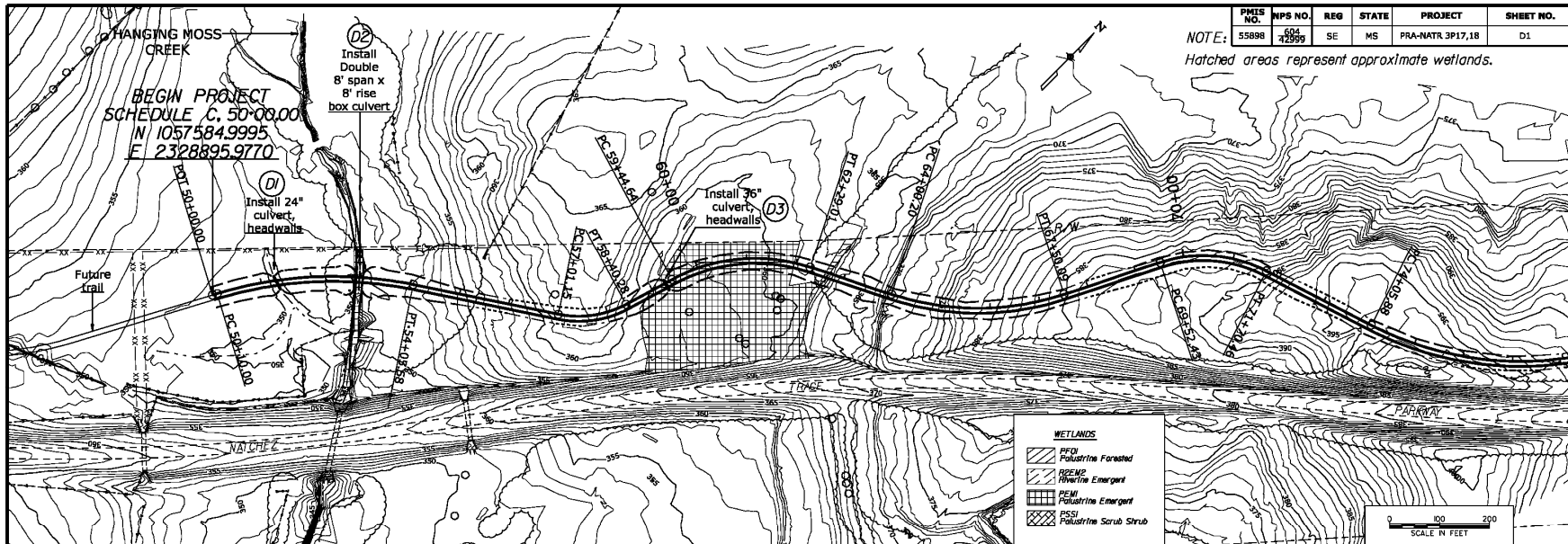
NATCHEZ TRACE PARKWAY

**TYPICAL SECTION
(SCHEDULE C)**

DATE
 TIME

PMIS NO.	NPS NO.	REG	STATE	PROJECT	SHEET NO.
55898	614 42895	SE	MS	PRA-NATR 3P17,18	D1

NOTE:
Hatched areas represent approximate wetlands.



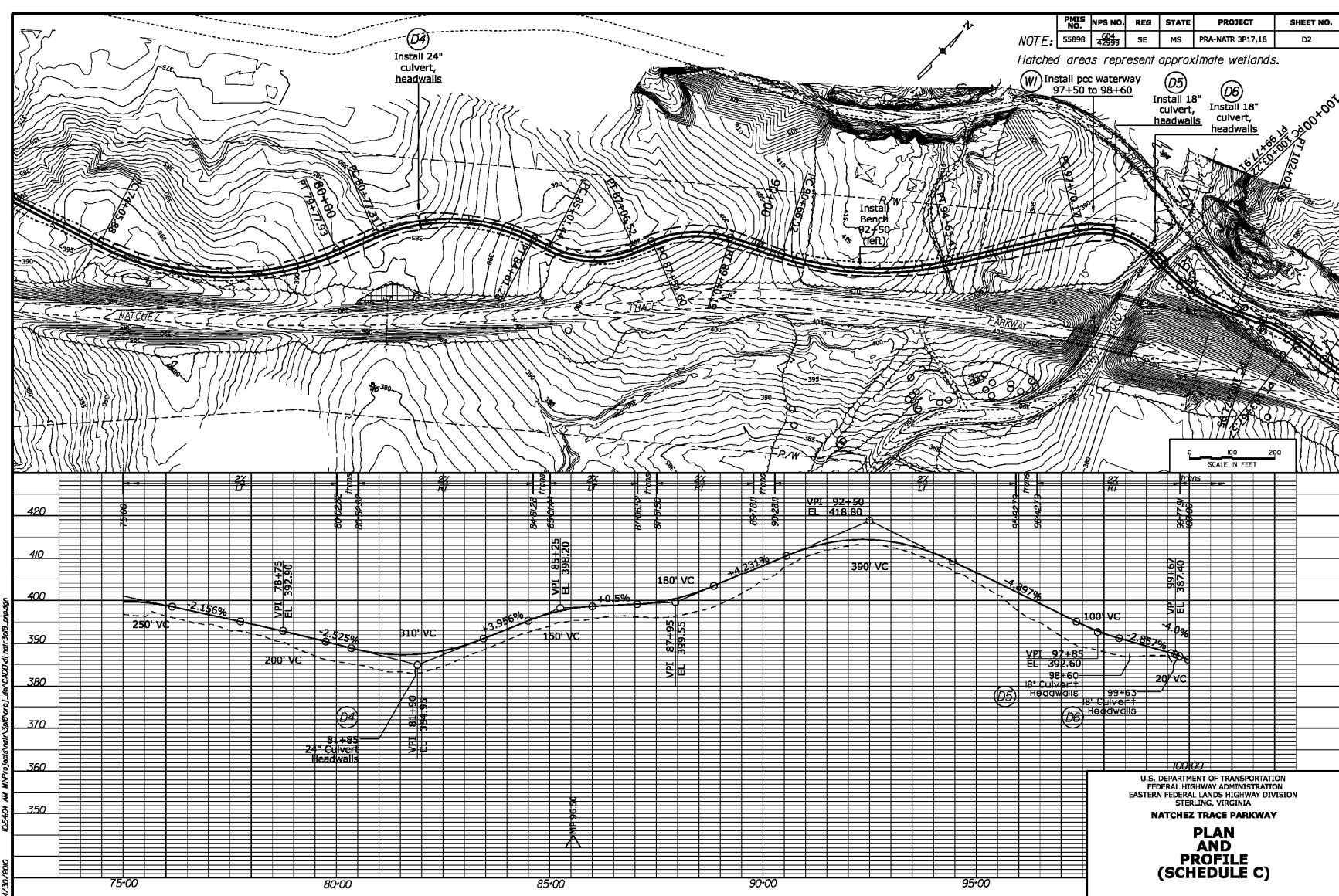
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
EASTERN FEDERAL LANDS HIGHWAY DIVISION
STERLING, VIRGINIA

NATCHEZ TRACE PARKWAY

PLAN AND PROFILE (SCHEDULE C)

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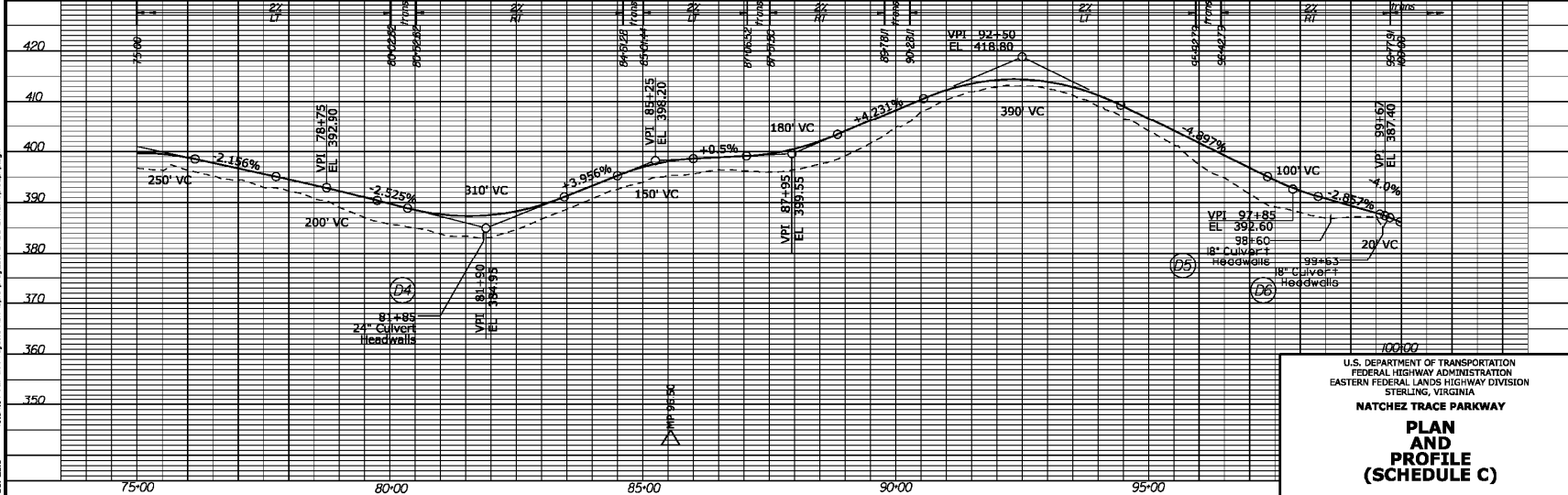
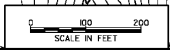


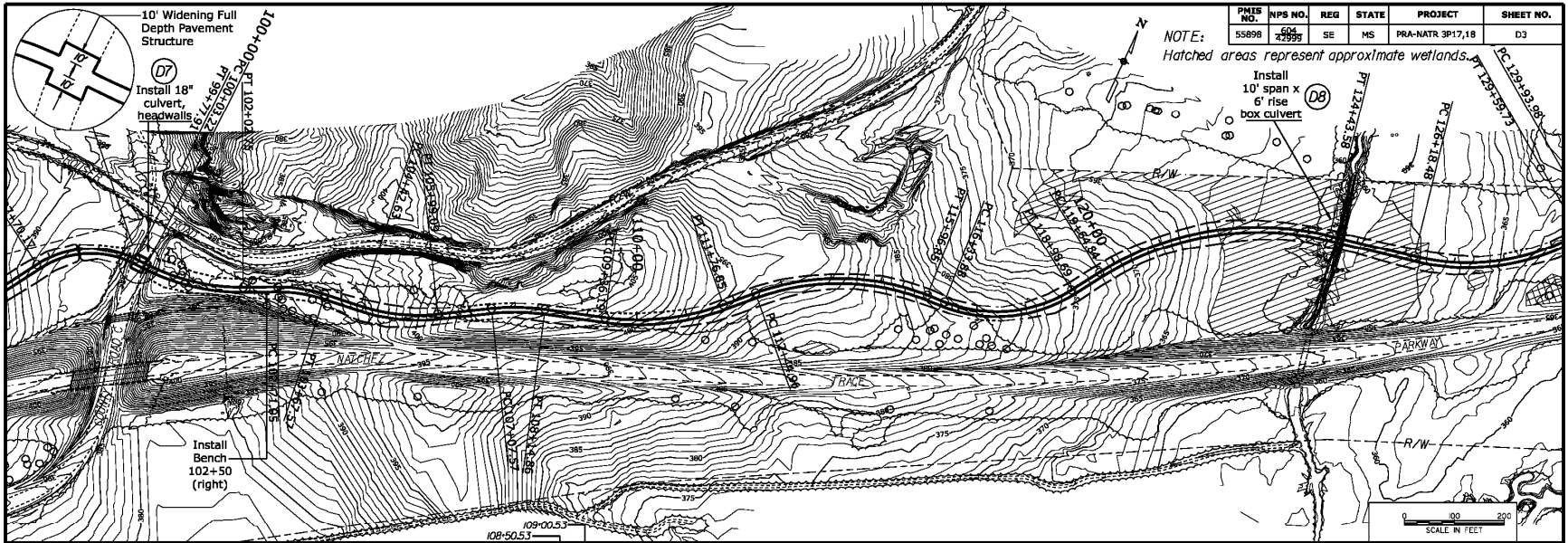
PMIS NO.	HPS NO.	REG.	STATE	PROJECT	SHEET NO.
55898	60	SE	MS	PRA-NATR 3P17,18	D2

NOTE: Hatched areas represent approximate wetlands.

- (W) Install pcc waterway 97+50 to 98+60
- (D4) Install 24" culvert, headwalls
- (D5) Install 18" culvert, headwalls
- (D6) Install 18" culvert, headwalls

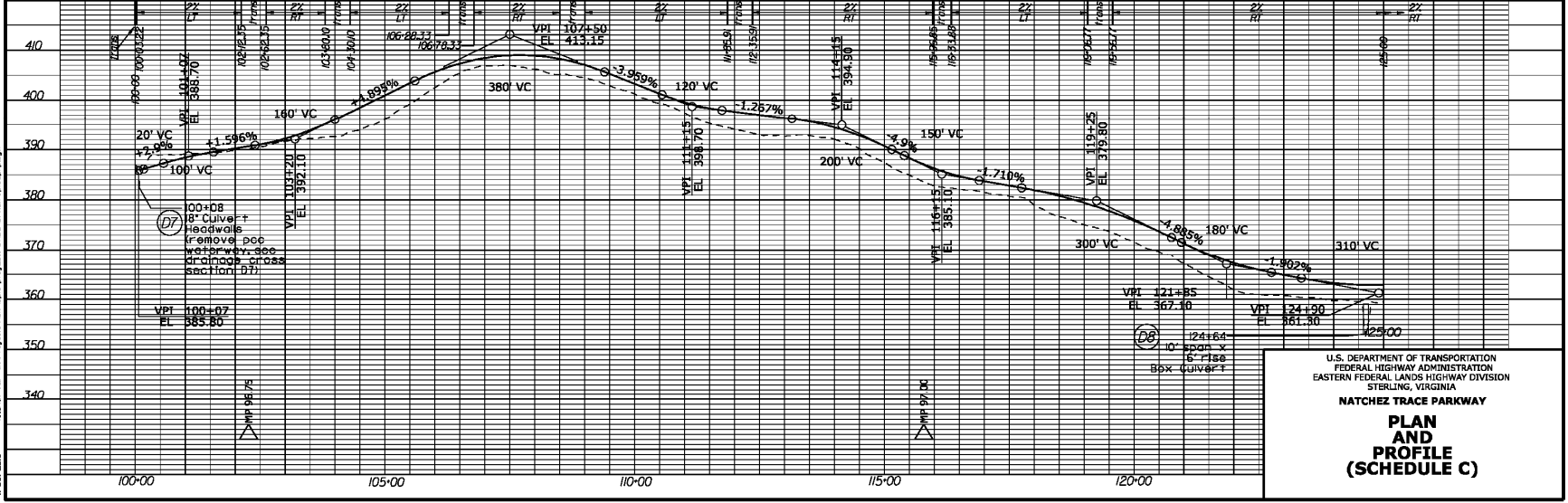
Install Bench 92+50 (left)





PNIS NO.	NPS NO.	REG.	STATE	PROJECT	SHEET NO.
55898	64	SE	MS	PRA-NATR 3P17,18	D3

NOTE:
Hatched areas represent approximate wetlands.

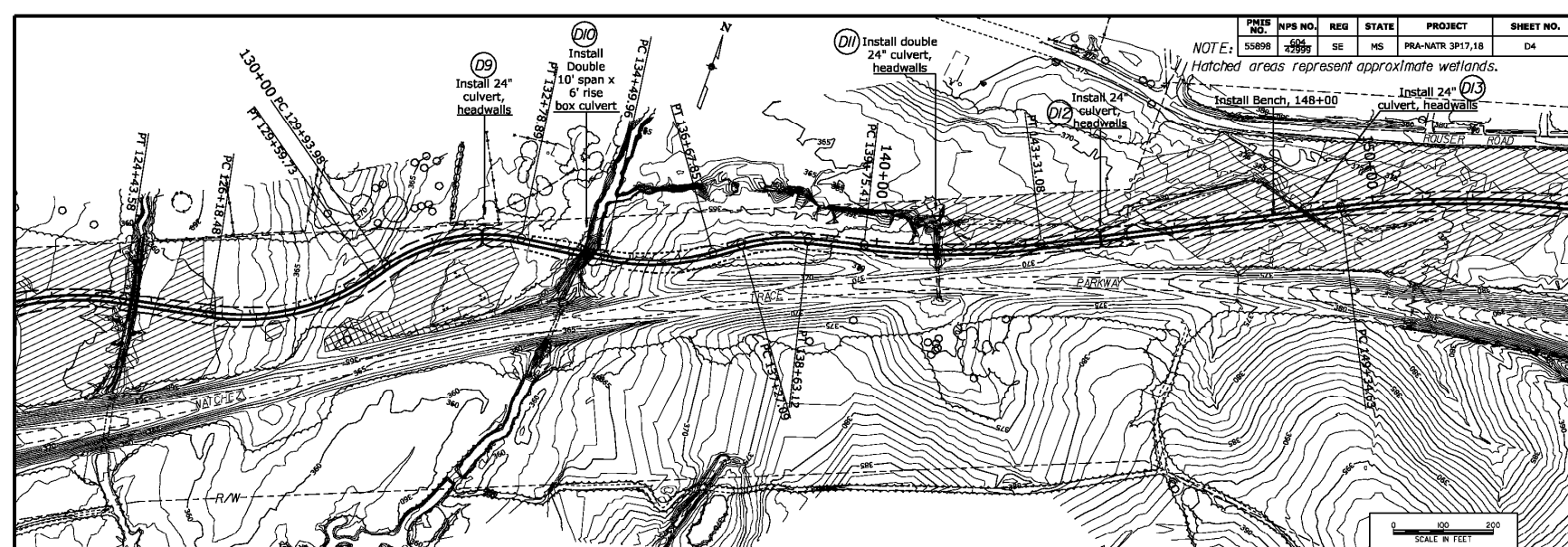


U.S. DEPARTMENT OF TRANSPORTATION
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EASTERN FEDERAL LANDS DIVISION
STERLING, VIRGINIA

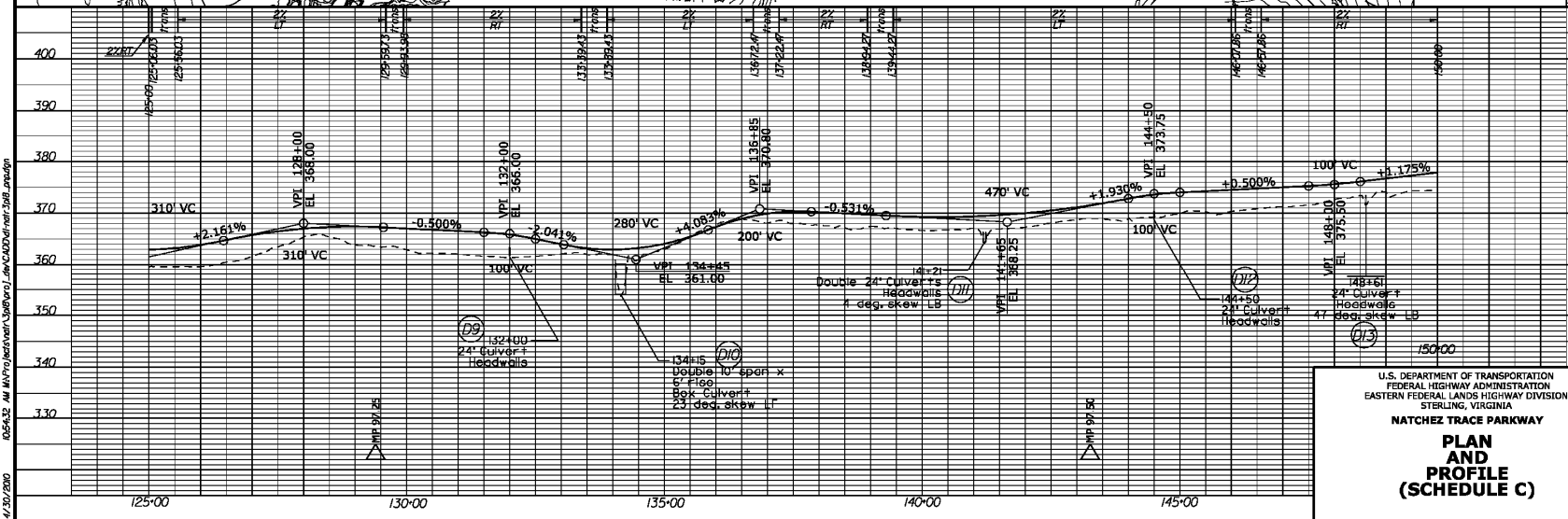
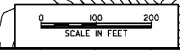
NATCHEZ TRACE PARKWAY

PLAN AND PROFILE (SCHEDULE C)

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U.S. DEPARTMENT OF TRANSPORTATION
 FEDERAL HIGHWAY ADMINISTRATION
 EASTERN FEDERAL LANDS HIGHWAY DIVISION
 STERLING, VIRGINIA

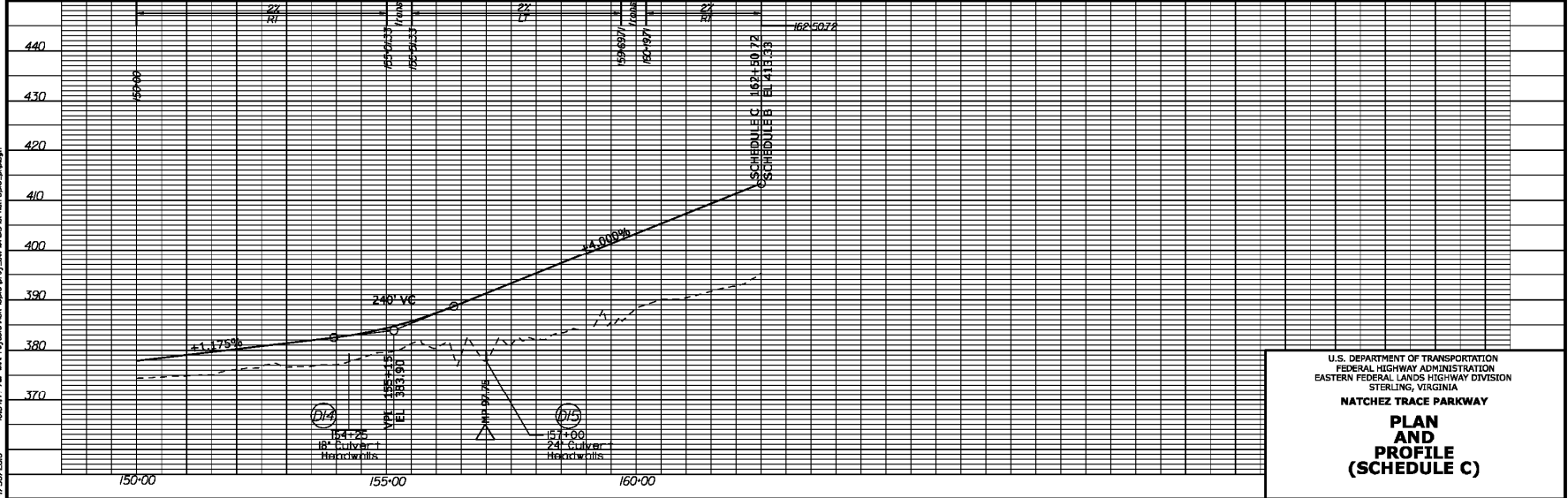
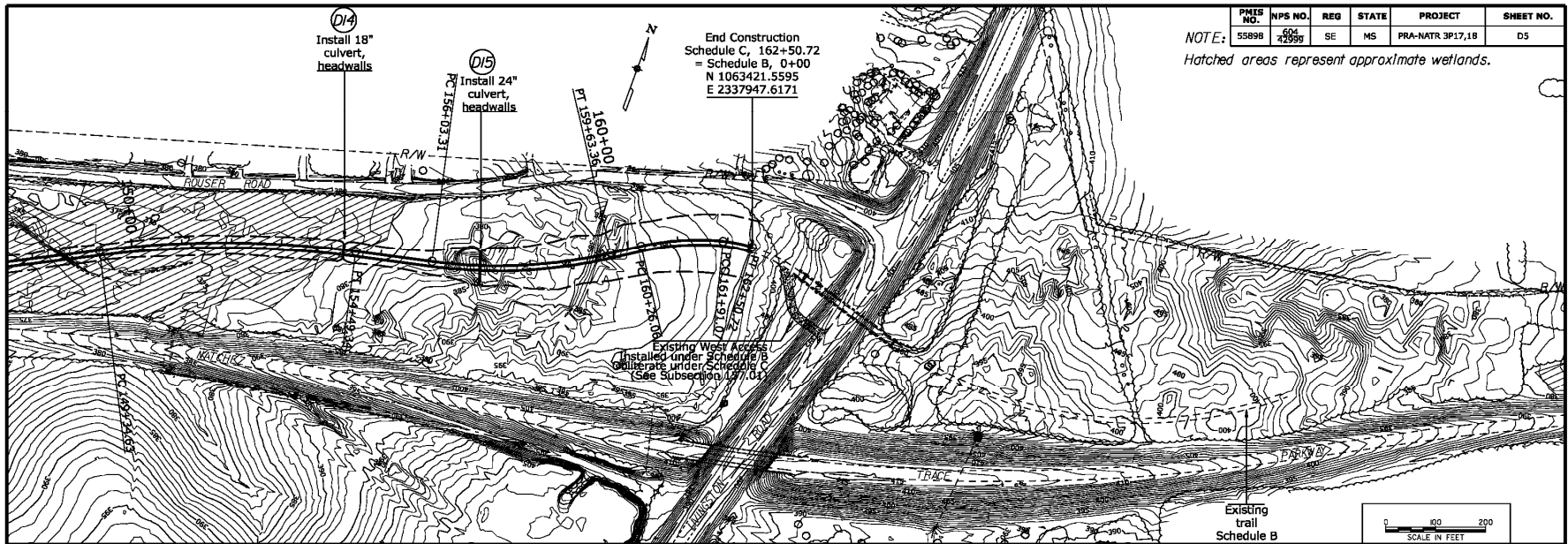
NATCHEZ TRACE PARKWAY

PLAN AND PROFILE (SCHEDULE C)

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55898	4295	SE	MS	PRA-NATR 3P17,18	D5

NOTE:
Hatched areas represent approximate wetlands.



U.S. DEPARTMENT OF TRANSPORTATION
 FEDERAL HIGHWAY ADMINISTRATION
 EASTERN FEDERAL LANDS HIGHWAY DIVISION
 STERLING, VIRGINIA

NATCHEZ TRACE PARKWAY

PLAN AND PROFILE (SCHEDULE C)

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APPENDIX B

List of Vascular Plants and Animals
Known to Occur along the NATR.

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APPENDIX B

List of vascular plants and animals known to occur along the NATR.

Vascular Plants (ASGEC 2008) known to occur in wetlands from milepost 95.8 to 200 feet west of Livingston Road (approximate milepost 97.85)	
Scientific Name	Common Name
<i>Acer negundo</i>	Box elder
<i>Baccharis halimifolia</i>	Groundsel tree
<i>Carex</i> spp.	Sedge spp.
<i>Celtis laevigata</i>	Sugarberry
<i>Cornus amomum</i>	Silky dogwood
<i>Fraxinus pennsylvanica</i>	Green ash
<i>Juncus effusus</i>	Soft rush
<i>Ligustrum sinense</i>	Chinese privet*
<i>Liquidambar styraciflua</i>	Sweet gum
<i>Lonicera japonica</i>	Japanese honeysuckle
<i>Mentha</i> spp.	Mint spp.
<i>Nasturtium officinale</i>	Spring cress
<i>Pinus taeda</i>	Loblolly pine
<i>Platanus occidentalis</i>	American sycamore
<i>Quercus nigra</i>	Water oak
<i>Sambucus canadensis</i>	Elderberry
<i>Smilax glauca</i>	Cat greenbrier
<i>Ulmus Americana</i>	American elm
<i>Vicia</i> spp.	Vetch spp.
Avifauna along the NATR (ABC 2001a)	
Scientific Name	Common Name
<i>Pelecanus erythrorhynchos</i>	American white pelican
<i>Phalacrocorax auritus</i>	Double-crested cormorant
<i>Nycticorax violacea</i>	Yellow-crowned night heron
<i>Butorides virescens</i>	Green heron
<i>Egretta caerulea</i>	Little blue heron

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Avifauna along the NATR (ABC 2001a)	
Scientific Name	Common Name
<i>Bubulcus ibis</i>	Cattle egret
<i>Egretta thula</i>	Snowy egret
<i>Ardea alba</i>	Great egret
<i>Ardea herodias</i>	Great blue heron
<i>Branta canadensis</i>	Canada goose
<i>Dendrocygna bicolor</i>	Fulvous whistling duck
<i>Aix sponsa</i>	Wood duck
<i>Anas platyrhynchos</i>	Mallard
<i>Cathartes aura</i>	Turkey vulture
<i>Coragyps atratus</i>	Black vulture
<i>Ictinia mississippiensis</i>	Mississippi kite
<i>Accipiter striatus</i>	Sharp-shinned hawk
<i>Accipiter cooperii</i>	Cooper's hawk
<i>Buteo platypterus</i>	Broad-winged hawk
<i>Buteo lineatus</i>	Red-shouldered hawk
<i>Buteo jamaicensis</i>	Red-tailed hawk
<i>Falco sparverius</i>	American kestrel
<i>Meleagris gallopavo</i>	Wild turkey
<i>Colinus virginianus</i>	Northern bobwhite
<i>Charadrius vociferous</i>	Killdeer
<i>Scolopax minor</i>	American woodcock
<i>Larus argentatus</i>	Herring gull
<i>Thalasseus maximus</i>	Royal tern
<i>Columba livia</i>	Rock dove
<i>Zenaida macroura</i>	Mourning dove
<i>Coccyzus americanus</i>	Yellow-billed cuckoo
<i>Coccyzus erythrophthalmus</i>	Black-billed cuckoo
<i>Bubo virginianus</i>	Great horned owl

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Avifauna along the NATR (ABC 2001a)	
Scientific Name	Common Name
<i>Strix varia</i>	Barred owl
<i>Otus asio</i>	Eastern screech owl
<i>Chordeiles minor</i>	Common nighthawk
<i>Caprimulgus carolinensis</i>	Chuck-wills-widow
<i>Caprimulgus vociferous</i>	Whip-poor-will
<i>Chaetura pelagica</i>	Chimney swift
<i>Archilachus colubris</i>	Ruby-throated hummingbird
<i>Megaceryle alcyon</i>	Belted kingfisher
<i>Melanerpes erythrocephalus</i>	Red-headed woodpecker
<i>Melanerpes carolinus</i>	Red-bellied woodpecker
<i>Colaptes auratus</i>	Northern flicker
<i>Sphyrapicus varius</i>	Yellow-bellied sapsucker
<i>Picoides pubescens</i>	Downy woodpecker
<i>Picoide villosus</i>	Hairy woodpecker
<i>Dryocopus pileatus</i>	Pileated woodpecker
<i>Contapus virens</i>	Eastern wood pewee
<i>Empidonax virescens</i>	Acadian flycatcher
<i>Sayornis phoebe</i>	Eastern phoebe
<i>Myiarchus crinitus</i>	Great-crested flycatcher
<i>Tyrannus tyrannus</i>	Eastern kingbird
<i>Lanius ludovicianus</i>	Loggerhead shrike
<i>Vireo griseus</i>	White-eyed vireo
<i>Vireo flavifrons</i>	Yellow-throated vireo
<i>Vireo olivaceous</i>	Red-eyed vireo
<i>Vireo gilvus</i>	Warbling vireo
<i>Cyanocitta cristata</i>	Blue jay
<i>Corvus brachyrhynchos</i>	American crow
<i>Corvus ossifragus</i>	Fish crow

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Avifauna along the NATR (ABC 2001a)	
Scientific Name	Common Name
<i>Progne subis</i>	Purple martin
<i>Petrachelidon pyrrhonota</i>	Cliff swallow
<i>Stelgidopteryx serripennis</i>	Northern rough-winged swallow
<i>Hirundo rustica</i>	Barn swallow
<i>Baeolophus bicolor</i>	Tufted titmouse
<i>Poecile carolinensis</i>	Carolina chickadee
<i>Certhia americana</i>	Brown creeper
<i>Sitta carolinensis</i>	White-breasted nuthatch
<i>Sitta canadensis</i>	Red-breasted nuthatch
<i>Sitta pusilla</i>	Brown-headed nuthatch
<i>Troglodytes aedon</i>	House wren
<i>Troglodytes troglodytes</i>	Winter wren
<i>Thryothorus ludovicianus</i>	Carolina wren
<i>Thryomanes bewickii</i>	Bewick's wren
<i>Regulus satrapa</i>	Golden-crowned kinglet
<i>Regulus calendula</i>	Ruby-crowned kinglet
<i>Polioptila caerulea</i>	Blue-gray gnatcatcher
<i>Sialia sialis</i>	Eastern bluebird
<i>Hylocichla mustelina</i>	Wood thrush
<i>Catharus guttatus</i>	Hermit thrush
<i>Turdus migratorius</i>	American robin
<i>Dumetella carolinensis</i>	Gray catbird
<i>Mimus polyglottos</i>	Northern mockingbird
<i>Toxostoma rufum</i>	Brown thrasher
<i>Sturnus vulgaris</i>	European starling
<i>Bombycilla cedrorum</i>	Cedar waxwing
<i>Protonotaria citrea</i>	Prothonotary warbler
<i>Vermivora pinus</i>	Blue-winged warbler

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Avifauna along the NATR (ABC 2001a)	
Scientific Name	Common Name
<i>Parula americana</i>	Northern parula
<i>Dendroica coronata</i>	Yellow-rumped warbler
<i>Mniotilta varia</i>	Black and white warbler
<i>Dendroica cerulea</i>	Cerulean warbler
<i>Dendroica dominica</i>	Yellow-throated warbler
<i>Dendroica discolor</i>	Prairie warbler
<i>Dendroica pinus</i>	Pine warbler
<i>Dendroica petechia</i>	Yellow warbler
<i>Oporornis formosus</i>	Kentucky warbler
<i>Wilsonia citrina</i>	Hooded warbler
<i>Helmitheros vermivorus</i>	Worm-eating warbler
<i>Limnothlypis swainsonii</i>	Swainson's warbler
<i>Turdus ludovicianus</i>	Louisiana waterthrush
<i>Geothlypis trichas</i>	Common yellowthroat
<i>Icteria virens</i>	Yellow-breasted chat
<i>Setophaga ruticilla</i>	American redstart
<i>Piranga rubra</i>	Summer tanager
<i>Piranga olivacea</i>	Scarlet tanager
<i>Pipilo erythrophthalmus</i>	Rufous-sided towhee
<i>Aimophila aestivalis</i>	Bachman's sparrow
<i>Spizella pusilla</i>	Field sparrow
<i>Spizella passerina</i>	Chipping sparrow
<i>Ammodramus savannarum</i>	Grasshopper sparrow
<i>Passerculus sandwichensis</i>	Savannah sparrow
<i>Melospiza melodia</i>	Song sparrow
<i>Zonotrichia albicollis</i>	White-throated sparrow
<i>Zonotrichia leucophrys</i>	White-crowned sparrow
<i>Junco hyemalis</i>	Dark-eyed junco

APPENDIX B

Avifauna along the NATR (ABC 2001a)	
Scientific Name	Common Name
<i>Cardinalus cardinalus</i>	Northern cardinal
<i>Spiza americana</i>	Dickcissel
<i>Passerina caerulea</i>	Blue grosbeak
<i>Passerina cyanea</i>	Indigo bunting
<i>Passerina ciris</i>	Painted bunting
<i>Dolichonyx oryzivorus</i>	Bobolink
<i>Sturnella magna</i>	Eastern meadowlark
<i>Agelaius phoeniceus</i>	Red-winged blackbird
<i>Quiscalus quiscula</i>	Common grackle
<i>Euphagus carolinus</i>	Rusty blackbird
<i>Molothrus ater</i>	Brown-headed cowbird
<i>Icterus spurius</i>	Orchard oriole
<i>Icterus galbula</i>	Northern oriole
<i>Carpodacus mexicanus</i>	House finch
<i>Carduelis pinus</i>	Pine siskin
<i>Carduelis tristis</i>	American goldfinch
<i>Passer domesticus</i>	House sparrow
Amphibians and Reptiles along the NATR (ABC 2001b)	
Scientific Name	Common Name
<i>Chrysemys scripta elegans</i>	Red-eared slider
<i>Rana utricularia</i>	Southern leopard frog
<i>Acris gryllus</i>	Southern cricket frog
<i>Rana clamitans melanota</i>	Green frog
<i>Rana clamitans clamitans</i>	Bronze frog
<i>Terrapene carolina triunguis</i>	Three-toed box turtle
<i>Scincella lateralis</i>	Ground skink
<i>Coluber constrictor priapus</i>	Southern black racer
<i>Acris crepitans</i>	Northern cricket frog

APPENDIX B

Amphibians and Reptiles along the NATR (ABC 2001b)	
Scientific Name	Common Name
<i>Notophthalmus viridescens</i>	Red-spotted newt
<i>Rana catesbeiana</i>	Bullfrog
<i>Eumeces fasciatus</i>	Five-lined skink
<i>Terrapene carolina carolina</i>	Eastern box turtle
<i>Elaphe guttata guttata</i>	Corn snake
<i>Lampropeltis getulus holbrooki</i>	Speckled kingsnake
<i>Sceloporus undulatus</i>	Eastern fence lizard
<i>Anolis carolinensis</i>	Green anole
<i>Plethodon glutinosus</i>	Slimy salamander
<i>Opheodrys aestivus</i>	Rough green snake
<i>Natrix sipedon pleuralis</i>	Midland water snake
<i>Hyla avivoca</i>	Bird-voiced tree frog
<i>Trionyx muticus</i>	Smooth softshell turtle
<i>Hyla versicolor and Hyla chrysoscelis</i>	Gray tree frog complex
<i>Agkistrodon contortix contortix</i>	Southern copperhead
<i>Natrix rhombifera</i>	Diamond-backed water snake
<i>Kinosternon subrubrum</i>	Eastern mud turtle
<i>Agkistrodon piscivorus leucostoma</i>	Western cottonmouth
<i>Coluber constrictor constrictor</i>	Northern black racer
<i>Eumeces laticeps</i>	Broad-headed skink
<i>Deirochelys reticularia</i>	Chicken turtle
<i>Bufo americanus</i>	American toad
<i>Natrix erythrogaster flavigaster</i>	Yellow-bellied water snake
<i>Hyla crucifer</i>	Spring peeper
<i>Elaphe obsoleta spiloides</i>	Gray rat snake
<i>Lampropeltis getulus niger</i>	Black kingsnake
<i>Chelydra serpentina</i>	Common snapping turtle
<i>Hyla squirella</i>	Squirrel tree frog

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Amphibians and Reptiles along the NATR (ABC 2001b)	
Scientific Name	Common Name
<i>Chrysemys picta dorsalis</i>	Southern painted turtle
<i>Eumeces inexpectatus</i>	Southeastern five-lines skink
<i>Farancia abacura</i>	Mud snake
<i>Natrix sipedon sipedon</i>	Northern water snake
<i>Thamnophis sirtalis sirtalis</i>	Eastern garter snake
<i>Siren intermedia nettingi</i>	Western lesser siren
<i>Heterodon platyrhinos</i>	Eastern hognose snake
<i>Sternotherus odoratus</i>	Stinkpot
<i>Thamnophis sauritus</i>	Eastern ribbon snake
<i>Gastrophryne carolinensis</i>	Eastern narrow-mouthed toad
<i>Alligator mississippiensis</i>	American alligator
<i>Bufo woodhousei fowleri</i>	Fowler's toad
<i>Carphaphis amoenus</i>	Eastern worm snake
<i>Pseudotriton ruber ruber</i>	Northern red salamander
<i>Farancia erytrogramma</i>	Rainbow snake
<i>Macrolemys temmincki</i>	Alligator snapping turtle
<i>Lampropeltis triangulum triangulum</i>	Eastern milk snake
<i>Chrysemys scripta scripta</i>	Yellow-bellied slider
<i>Hyla cinerea</i>	Green tree frog
<i>Graptemys kohni</i>	Mississippi Map Turtle
<i>Crotalus horridus atricaudatus</i>	Canebrake rattlesnake
<i>Diadophis punctatus</i>	Ringneck snake
<i>Pseudacris triseriata feriarum</i>	Upland chorus frog
<i>Elaphe obsoleta obsoleta</i>	Black rat snake
<i>Lampropeltis calligaster rhombomaculata</i>	Mole kingsnake
<i>Ambystoma talpoideum</i>	Mole salamander
<i>Chrysemys concinna</i>	Slider
<i>Virginia valeriae</i>	Smooth earth snake

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Amphibians and Reptiles along the NATR (ABC 2001b)	
Scientific Name	Common Name
<i>Sternotherus carinatus</i>	Razor-backed musk turtle
<i>Amphiuma tridactylum</i>	Three-toed amphiuma
Mammals along the NATR (NPS 2007c)	
Scientific Name	Common Name
<i>Didelphis virginiana</i>	Opossum
<i>Scalopus aquaticus</i>	Eastern mole
<i>Blarina carolinensis</i>	Southern short-tailed shrew
<i>Sorex longirostris</i>	Southeastern shrew
<i>Cryptotis parva</i>	Least shrew
<i>Myotis grisescens</i>	Gray bat
<i>Myotis lucifugus</i>	Little brown myotis
<i>Myotis septentrionalis</i>	Northern myotis
<i>Myotis sodalis</i>	Social myotis
<i>Myotis austroriparius</i>	Southeastern myotis
<i>Lasionycteris noctivagans</i>	Silver-haired bat
<i>Pipistrellus subflavus</i>	Eastern pipistrelle
<i>Eptesicus fuscus</i>	Big brown bat
<i>Lasiurus borealis</i>	Eastern Red bat
<i>Lasiurus intermedius</i>	Northern yellow bat
<i>Lasiurus seminolus</i>	Seminole bat
<i>Lasiurus cinereus</i>	Hoary bat
<i>Nycticeius humeralis</i>	Evening bat
<i>Plecotus rafinesquii</i>	Rafinesque's big-eared bat
<i>Tadarida brasiliensis</i>	Brazilian free-tailed bat
<i>Dasyopus novemcinctus</i>	Nine-banded armadillo
<i>Sylvilagus floridanus</i>	Eastern cottontail
<i>Sylvilagus aquaticus</i>	Swamp rabbit
<i>Tamias striatus</i>	Eastern chipmunk

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Mammals along the NATR (NPS 2007c)	
Scientific Name	Common Name
<i>Marmota monax</i>	Woodchuck
<i>Sciurus carolinensis</i>	Eastern gray squirrel
<i>Sciurus niger</i>	Fox squirrel
<i>Glaucomys volans</i>	Southern flying squirrel
<i>Castor canadensis</i>	Beaver
<i>Oryzomys palustris</i>	Rice rat
<i>Reithrodontomys humulis</i>	Eastern harvest mouse
<i>Reithrodontomys fulvescens</i>	Fulvous harvest mouse
<i>Peromyscus leucopus</i>	White-footed mouse
<i>Peromyscus gossypinus</i>	Cotton mouse
<i>Peromyscus polionotus</i>	Oldfield mouse
<i>Ochrotomys nuttalli</i>	Golden mouse
<i>Sigmodon hispidus</i>	Hispid cotton rat
<i>Neotoma floridana</i>	Eastern woodrat
<i>Microtus ochrogaster</i>	Prairie vole
<i>Microtus pinetorum</i>	Woodland vole
<i>Zapus hudsonius</i>	Meadow jumping mouse
<i>Ondatra zibethicus</i>	Muskrat
<i>Rattus norvegicus</i>	Norway rat
<i>Mus musculus</i>	House mouse
<i>Canis latrans</i>	Coyote
<i>Vulpes vulpes</i>	Red fox
<i>Urocyon cinereoargenteus</i>	Gray fox
<i>Procyon lotor</i>	Raccoon
<i>Mustela frenata</i>	Long-tailed weasel
<i>Mustela vison</i>	Mink
<i>Mephitis mephitis</i>	Striped skunk
<i>Spilogale putorius</i>	Eastern spotted skunk

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Mammals along the NATR (NPS 2007c)	
Scientific Name	Common Name
<i>Lutra canadensis</i>	River otter
<i>Odocoileus virginianus</i>	White-tailed deer
<i>Lynx rufus</i>	Bobcat
<i>Ursus americanus</i>	Black bear
<i>Felis concolor</i>	Mountain lion
Fish along the NATR (NPS 2007b)	
Scientific Name	Common Name
<i>Ameiurus natalis</i>	Yellow bullhead
<i>Amia calva</i>	Bowfin
<i>Aphredoderus sayanus</i>	Pirate perch
<i>Campostoma anomalum</i>	Central stoneroller
<i>Campostoma oligolepis</i>	Largescale stoneroller
<i>Carpiodes carpio</i>	River carpsucker
<i>Carpiodes cyprinus</i>	Quillback, Quillback carpsucker
<i>Carpiodes velifer</i>	Highfin carpsucker
<i>Centrarchus macropterus</i>	Flier, Peacock sunfish, Round sunfish
<i>Clinostomus funduloides</i>	Rosyside dace
<i>Cottus carolinae</i>	Banded sculpin
<i>Cyprinella camura</i>	Bluntnose shiner
<i>Cyprinella galactura</i>	Whitetail shiner
<i>Cyprinella lutrensis</i>	Red shiner
<i>Cyprinella spiloptera</i>	Spotfin shiner
<i>Cyprinella venusta</i>	Blacktail shiner
<i>Cyprinella whipplei</i>	Steelcolor shiner
<i>Dorosoma cepedianum</i>	American gizzard shad, Eastern gizzard shad, Gizzard shad, Hickory shad, Mud shad, Skipjack
<i>Dorosoma petenense</i>	Threadfin shad
<i>Erimyzon oblongus</i>	Creek chubsucker

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Fish along the NATR (NPS 2007b)	
Scientific Name	Common Name
<i>Esox americanus</i>	Grass pickerel, Redfin, Redfin pickerel
<i>Etheostoma blennioides</i>	Greenside darter
<i>Etheostoma blennius</i>	Blenny darter
<i>Etheostoma boschungii</i>	Slackwater darter
<i>Etheostoma caeruleum</i>	Rainbow darter
<i>Etheostoma chlorosomum</i>	Bluntnose darter
<i>Etheostoma corona</i>	Crown darter
<i>Etheostoma crossopterygum</i>	Fringed darter
<i>Etheostoma derivativum</i>	
<i>Etheostoma duryi</i>	Black darter, Blackside darter, Blackside snubnose darter
<i>Etheostoma flabellare</i>	Fantail darter
<i>Etheostoma flavum</i>	Saffron darter
<i>Etheostoma histrio</i>	Harlequin darter
<i>Etheostoma kennicotti</i>	Stripetail darter
<i>Etheostoma lachneri</i>	Tombigbee darter
<i>Etheostoma lynceum</i>	Brighteye darter
<i>Etheostoma nigrum</i>	Johnny darter
<i>Etheostoma proeliare</i>	Cypress darter
<i>Etheostoma rufilineatum</i>	Redline darter
<i>Etheostoma simotermum</i>	Snubnose darter, Tennessee snubnose darter
<i>Etheostoma swaini</i>	Gulf darter
<i>Etheostoma whipplei</i>	Redfin darter
<i>Etheostoma zonale</i>	Banded darter
<i>Fundulus catenatus</i>	Northern studfish
<i>Fundulus notatus</i>	Blackstripe topminnow
<i>Fundulus olivaceus</i>	Blackspotted topminnow
<i>Gambusia affinis</i>	Mosquitofish, Western mosquitofish

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Fish along the NATR (NPS 2007b)	
Scientific Name	Common Name
<i>Hemitremia flammea</i>	Flame chub
<i>Hybognathus nuchalis</i>	Mississippi silvery minnow
<i>Hybopsis amblops</i>	Bigeye chub
<i>Hybopsis winchelli</i>	Clear chub
<i>Hypentelium nigricans</i>	Northern hog sucker
<i>Ictalurus punctatus</i>	Channel catfish, Graceful catfish
<i>Labidesthes sicculus</i>	Brook silverside
<i>Lepisosteus oculatus</i>	Shortnose gar, Spotted gar
<i>Lepisosteus osseus</i>	'Longnose gar
<i>Lepomis cyanellus</i>	Green sunfish
<i>Lepomis gulosus</i>	Warmouth
<i>Lepomis macrochirus</i>	Bluegill
<i>Lepomis megalotis</i>	Longear sunfish
<i>Lepomis microlophus</i>	Redear sunfish
<i>Lepomis miniatus</i>	Redspotted sunfish, Scarlet sunfish
<i>Luxilus chrysocephalus</i>	Striped shiner
<i>Luxilus coccogenis</i>	Warpaint shiner
<i>Luxilus zonistius</i>	Bandfin shiner
<i>Lythrurus ardens</i>	Rosefin shiner
<i>Lythrurus bellus</i>	Pretty shiner
<i>Lythrurus roseipinnis</i>	Cherryfin shiner
<i>Lythrurus umbratilis</i>	Redfin shiner
<i>Micropterus punctulatus</i>	Spotted bass
<i>Micropterus salmoides</i>	Largemouth bass
<i>Minytrema melanops</i>	Spotted sucker
<i>Moxostoma duquesnei</i>	Black redhorse
<i>Moxostoma erythrurum</i>	Golden redhorse
<i>Nocomis leptocephalus</i>	Bluehead chub

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Fish along the NATR (NPS 2007b)	
Scientific Name	Common Name
<i>Nocomis micropogon</i>	River chub
<i>Notemigonus crysoleucas</i>	Golden shiner
<i>Notropis ammophilus</i>	Orangefin shiner
<i>Notropis atherinoides</i>	Emerald shiner
<i>Notropis baileyi</i>	Rough shiner
<i>Notropis leuciodus</i>	Tennessee shiner
<i>Notropis longirostris</i>	Longnose shiner
<i>Notropis stilbius</i>	Silverstripe shiner
<i>Notropis telescopus</i>	Telescope shiner
<i>Notropis texanus</i>	Weed shiner
<i>Notropis wickliffi</i>	Channel shiner
<i>Noturus funebris</i>	Black madtom
<i>Noturus gyrinus</i>	Tadpole madtom
<i>Noturus miurus</i>	Brindled madtom
<i>Opsopoeodus emiliae</i>	Pugnose minnow
<i>Percina caprodes</i>	Logperch
<i>Percina maculata</i>	Blackside darter
<i>Percina sciera</i>	Dusky darter
<i>Percina vigil</i>	Saddleback darter
<i>Phoxinus erythrogaster</i>	Southern redbelly dace
<i>Pimephales notatus</i>	Bluntnose minnow
<i>Pimephales vigilax</i>	Bullhead minnow
<i>Pomoxis annularis</i>	White crappie
<i>Pomoxis nigromaculatus</i>	Black crappie
<i>Rhinichthys atratulus</i>	Blacknose dace, Eastern blacknose dace
<i>Semotilus atromaculatus</i>	Creek chub



As the nation's principal conservation agency, the Department of the Interior has the responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historic places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. Administration.

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