National Park Service
U.S. Department of the Interior

Natchez Trace Parkway
Mississippi

WETLAND STATEMENT OF FINDINGS

FOR

EXECUTIVE ORDER 11990 ("WETLAND PROTECTION")

NATCHEZ TRACE MULTI-USE TRAIL
PROJECT NATR 055898-3P20
MILEPOST 50+00.00 TO 200 FEET WEST OF COUNTY LINE ROAD
(APPROXIMATELY FROM MILEPOST 50+00.00 TO MILEPOST 117+50.12)
NATCHEZ TRACE PARKWAY

HINDS COUNTY, MISSISSIPPI

Recommended: _____ 7/30/13
Superintendent, Natchez Trace Parkway — Date

Concurred: _____ 8/08/13
Water Resources Division — Date

Approved: _____ 9/3/13
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 1.28 miles of multi-use trail, hereafter referred to as the trail, from milepost 50+00 to 200 feet west of County Line Road (approximate milepost 117+50.12) 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.

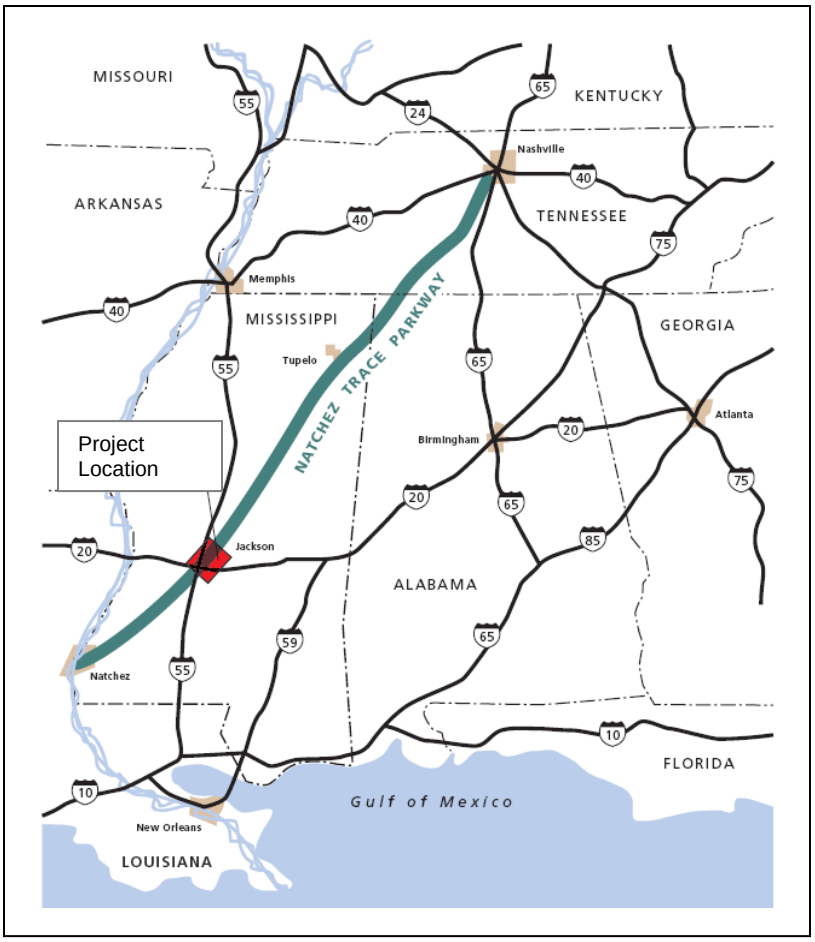

Figure 1. Project location on the Natchez Trace Parkway.

The trail segment will be located in the Jackson, Mississippi metropolitan area, as depicted in Figure 1. The NPS proposes to construct the 1.28-mile long trail segment along the north side of the NATR motor road. The FHWA Location Maps are 70% 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). **UPDATED MAP FOR THIS SECTION**

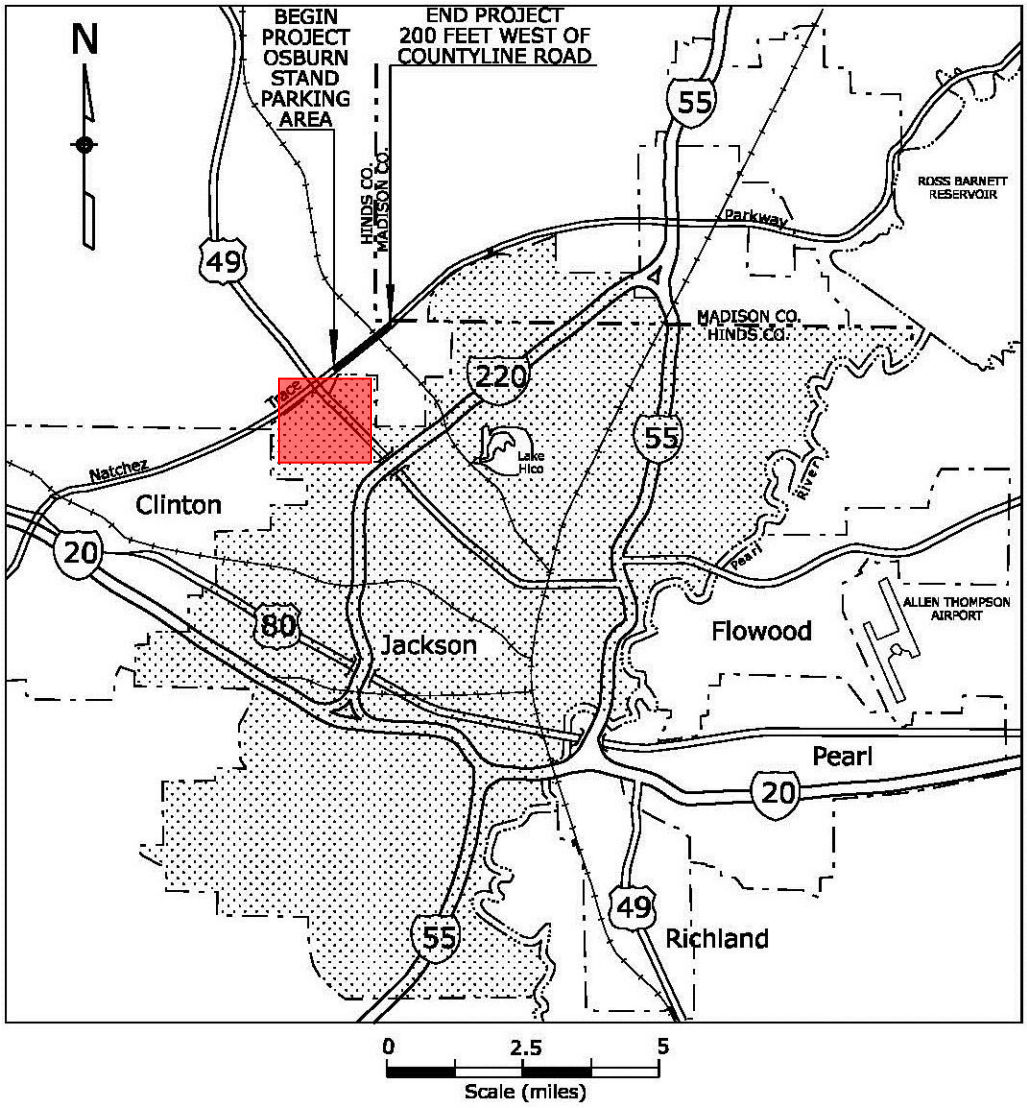

Figure 2. Project location.

The trail profile will closely match the existing ground elevations. See sheet No. A4 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 70 percent complete trail design there appears to be a total of 0.15 acres of wetland impacts in this project; 6,258 square feet of Palustrine Forested Broad-leaved Deciduous Wetland, 83 square feet of Palustrine Emergent, and 203 square feet of Riverine Emergent.

For ease of reading the terms Palustrine Forested Broad-leaved Deciduous Wetland and Palustrine Emergent Persistent Wetland will be shortened to Palustrine Forested Wetland and

Palustrine Emergent Wetland respectively. These impacts are described in detail further in the document.

Wetlands intersecting the trail at Station 58+00 to Station 59+50 were delineated in 2008 as Palustrine Forested Wetlands (EA) (NPS 1995). At this Station, one 42-inch culvert with headwalls will be installed in a small drainage. Locations are identified by such stations throughout the document and can be located on the Location Map sheets that illustrate the trail route located in Appendix A. Wetlands intersecting the trail at Station 71+16.50 were delineated in 2008 as Palustrine Forested Wetlands (ASGEC, 2008.) At this station, one 30-inch culvert with headwalls will be installed in a small drainage. See Sheet No. D1 of the FHWA Location Map Sheets in Appendix A.

Wetlands intersecting the trail at Station 81+32 were delineated in 2008 as Riverine Emergent Wetlands (ASGEC, 2008). At this Station, one 6-foot reinforced concrete pipe will be installed to provide drainage for Bogue Chitto Creek Tributary 8. At Station 83+00 an 8-foot span x 8-foot rise box culvert (for an agricultural underpass) will be installed. A 24-inch culvert will be installed at Stations 91+50 and 108+00 to provide drainage for small drainage areas. See Sheet No. D2 and D3 of the FHWA Location Map Sheets in Appendix A.

Class 3 riprap is usually used at culvert outlets. The 24-inch culverts built at these culverts will have 3.8 tons of Class 3 riprap placed around each one. This equates to a 15-foot long headwall with a 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 1.28-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. The Preferred 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 1.28-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 93.70 to 200 feet west of County Line Road (approximate milepost 94.95) 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 due to funding constraints. Design of a 2.2-mile segment (3O16) of this multi-use trail was completed in 2008, and construction was completed December 1, 2011. 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 was completed January 10, 2012. Wetland impacts of the 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 the Spring 2013.

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 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).

In late December 2011, an office review of the 30 percent design plans for the current trail segment (3P20) 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, NPS-SER 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). The 70 percent field review is scheduled for early June 2013 and construction will begin in Spring of either 2014 or 2015 depending on the availability of funding.

Wetlands in the project area

The project area, the segment of the trail from milepost 50+00.00 to 200 feet west of County Line Road (approximate milepost 117+50.12) 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 areas border the NATR's motor road edge of pavement (ASGEC 2007).

Many of the wetlands receive urban road and parking lot runoff; some are associated with drainage ditches, four of those drainage ditches including Hanging Moss Creek Tributary 8 are located in wetland areas. 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 above mentioned delineation identified wetlands that are classified according to USFWS, Cowardin et al. (1979) as palustrine and riverine systems. Of the 0.15 acres of wetlands being impacted by the construction of the multi-use trail, 6,258 Square feet of wetlands were classified as Palustrine Forested Broad-leaved Deciduous Wetland (PFO1), 83 square feet were classified as Palustrine Emergent Persistent Wetland (PEM), and 203 square feet was classified as Riverine Lower Perennial Emergent Non-Persistent Wetland (R2EM2). Sheets No. D1-D3 of the FHWA Location Maps in Appendix A illustrates 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.
The FHWA Location Maps are 70% 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).

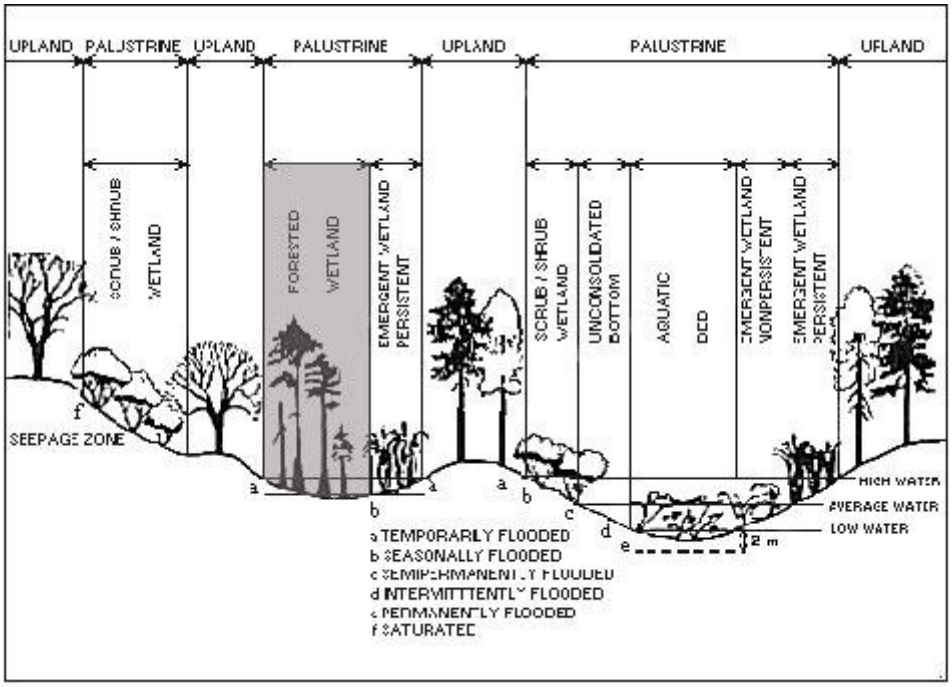

Figure 3. A palustrine forested broad-leaved deciduous wetland (USFWS, Cowardin et al. 1979).

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).

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 ruticalla*), 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; T.R.llazo 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 (*Baelophus 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 virescens*), 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).

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).

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 (*Lasionycteris 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 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.

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*).

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

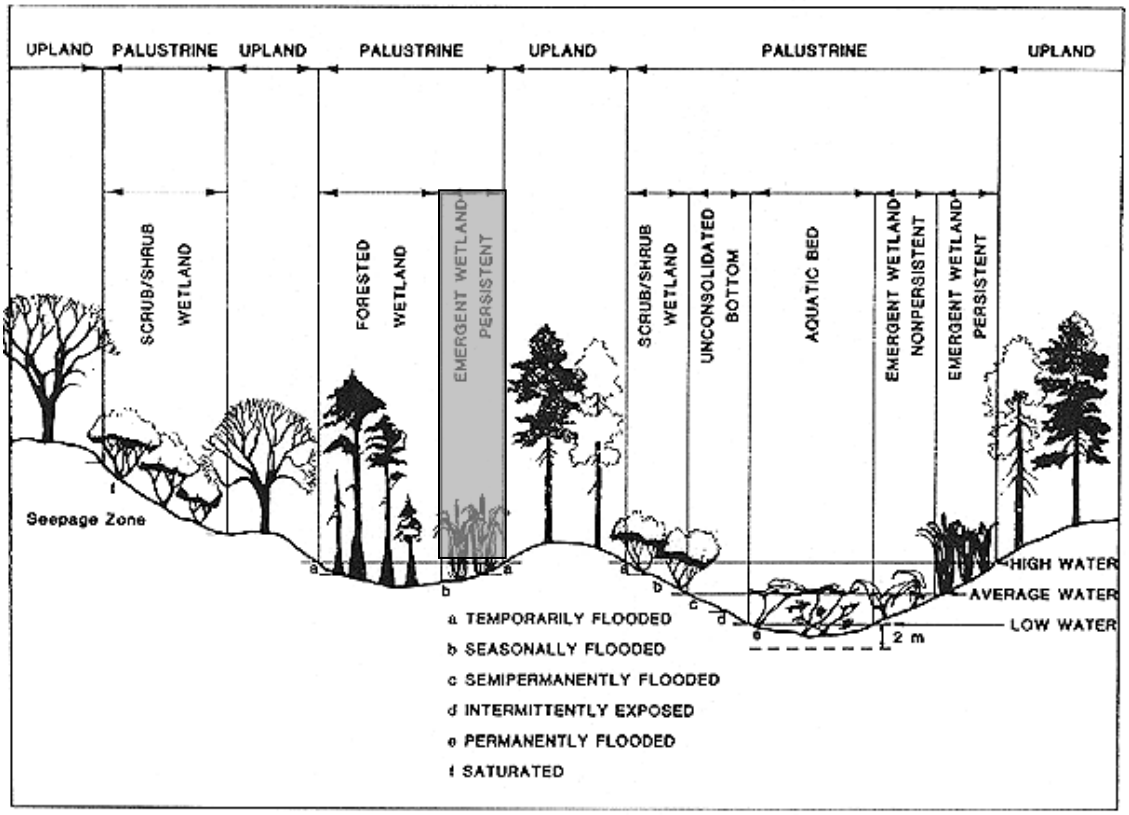

Figure 4. A Palustrine Emergent Persistent Wetland (USFWS, Cowardin et al. 1979).

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.

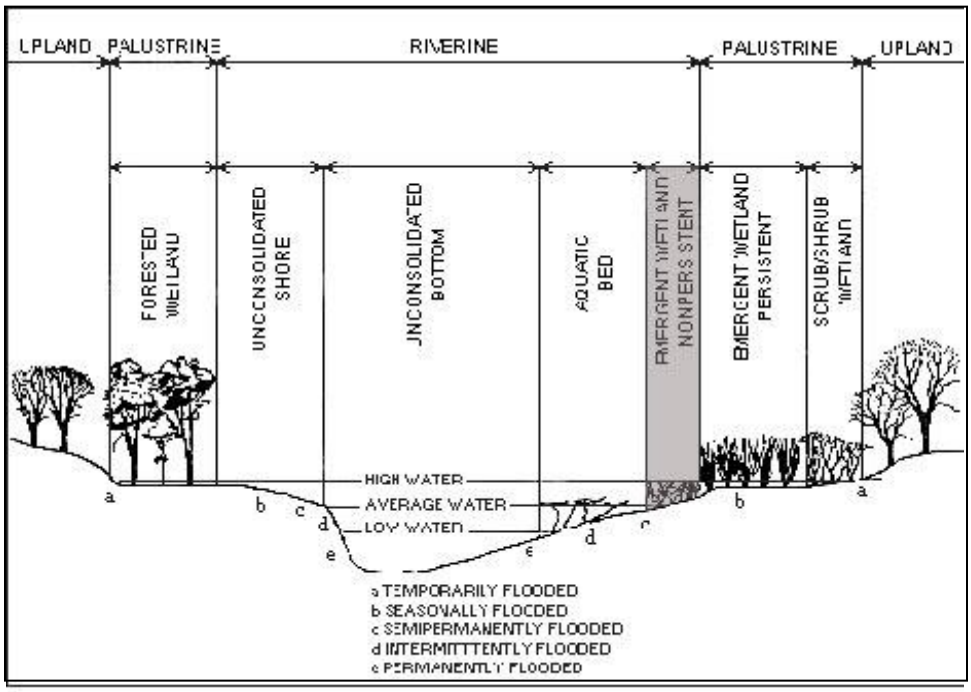

Figure 5. A Riverine Emergent Wetland (USFWS, Cowardin et al. 1979).

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*). 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*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

NPS in cooperation with the FHWA is proposing to design and construct approximately 1.28 miles trail from milepost 50+00.00 to 200 feet west of County Line Road (approximate milepost 117+50.12) within the NATR motor road right of way. Design emphasis has been to avoid and minimize impacts to wetland resources. Approximately 0.15 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 93.70 near Jackson, Mississippi (Figure 2). The trail alignment travels east midway between the NATR motor road and the NATR boundary. The trail alignment intersects wetlands at trail at Station 58+00 to Station 59+50. These wetlands were delineated in 2008 as Palustrine Forested Wetlands. The impacted area of Wetland is 5,303 square feet. At this Station, one 42-inch culvert with headwalls will be installed in a small drainage. Construction activities on the drainage area would temporarily increase sedimentation in the drainage and the Palustrine forested wetland downstream of the new culvert with headwalls, which would also impact aquatic organism, such as insects, fish and wildlife, using the drainage. See Sheet No. D1 of the FHWA Location Map Sheets in Appendix A.

The trail alignment continues east for a short distance and then intersects 955 square feet of Palustrine Forested Wetlands at Station 71+16.50. At this station a 30-inch culvert with headwalls will be installed at a small drainage. Construction activities on the drainage area would temporarily increase sedimentation in the drainage and the Palustrine forested wetland downstream of the new culvert with headwalls, which would also impact aquatic organism, such as insects, fish and wildlife, using the drainage. See Sheet No. D1 of the FHWA Location Map Sheets in Appendix A.

The trail alignment continues east and then intersects an intermittent stream at Station 81+32, consisting of 203 Square feet of Riverine Emergent Wetlands. At this station a 6-foot reinforced concrete pipe (RCP) will be installed. This 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 RCP, which would also impact aquatic organisms, such as insects, fish and wildlife, using the stream and streambank. See Sheet No. D2 of the FHWA Location Map Sheets in Appendix A.

The trail will continue to travel east through 83 square feet of Palustrine Emergent Wetlands at the construction access area adjacent to the Hilda Drive ditch at approximately Station 100+00. 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. See Sheet No. D2 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 (Sheet A4).

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 tributary 8, as well as the other three drainage areas 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.

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 70% complete and are subject to change. The plans have not yet been finalized for construction.

Mitigation

Approximately 0.15 acres of wetlands will be impacted by trail construction – 6,258 square feet of which are Palustrine Forested Wetland, 203 square feet of which are Riverine Emergent Wetland, and 203 square feet of which are Palustrine Emergent Wetland. The NPS will provide compensation through the restoration of approximately 0.3 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 (203 square feet) 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 203 square feet of Riverine Emergent Wetlands.

The restoration plan will include mowing cessation of the entire 1.92 acres (Figure 6) and allowing the area to naturally regenerate. The area is currently covered with vegetation 1-3 feet tall. Although it is still reclaimable for planting trees, it is far more efficient to allow the area to naturally regenerate. The adjacent area has been allowed to naturally regenerate within the last 2 years and has successfully produced Green Ash and Sweetgum that are 5-10 feet tall; the same is expected of this area. Although only 0.3 acres are needed to meet the 1:2 ratio of disturbed area, this area will provide an additional 1.62 acres that will be banked for future mitigation needs. This area was chosen based upon its proximity to existing wetland mitigation areas, thereby expanding the area of continuous wetland habitat.

Figure 6. 3P20 Proposed Wetland Restoration Site.

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% survival with native tree species, with planting supplementation as needed to achieve that rate. 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), beginning immediately after mowing cessation, 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 allowing vegetation to naturally grow. If needed, supplemental planting will be done, and another monitoring survey will be done after the second growing season. By this time, vegetation should be well-established. 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 (as-built conditions) report will document plant densities and describe the conditions of the restoration areas after restoration is completed and after mowing is stopped. The monitoring reports will document the progress of the restoration efforts and monitor the success of the naturally growing 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.

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. It is assumed that regarding and restoration will begin sometime after sometime after 2015, after construction has begun. 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:

MITIGATION ACTIVITY	DUE DATE
Mowing cessation begins	Spring 2013
Time-zero monitoring report	Spring 2014
First monitoring report (after first growing season)	Spring 2015
Second monitoring report (after second growing season)	Spring 2016
No monitoring will be done after the third and fourth growing season	2017-2018
Final monitoring report (after fifth growing season)	Spring 2019

Table 7. Work schedule plan.

Justification for Use of Wetlands

The NPS proposes to construct a 1.28-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 0.15 acres of wetlands along the alignment of a trail between approximately mileposts 93.70 to 94.95 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

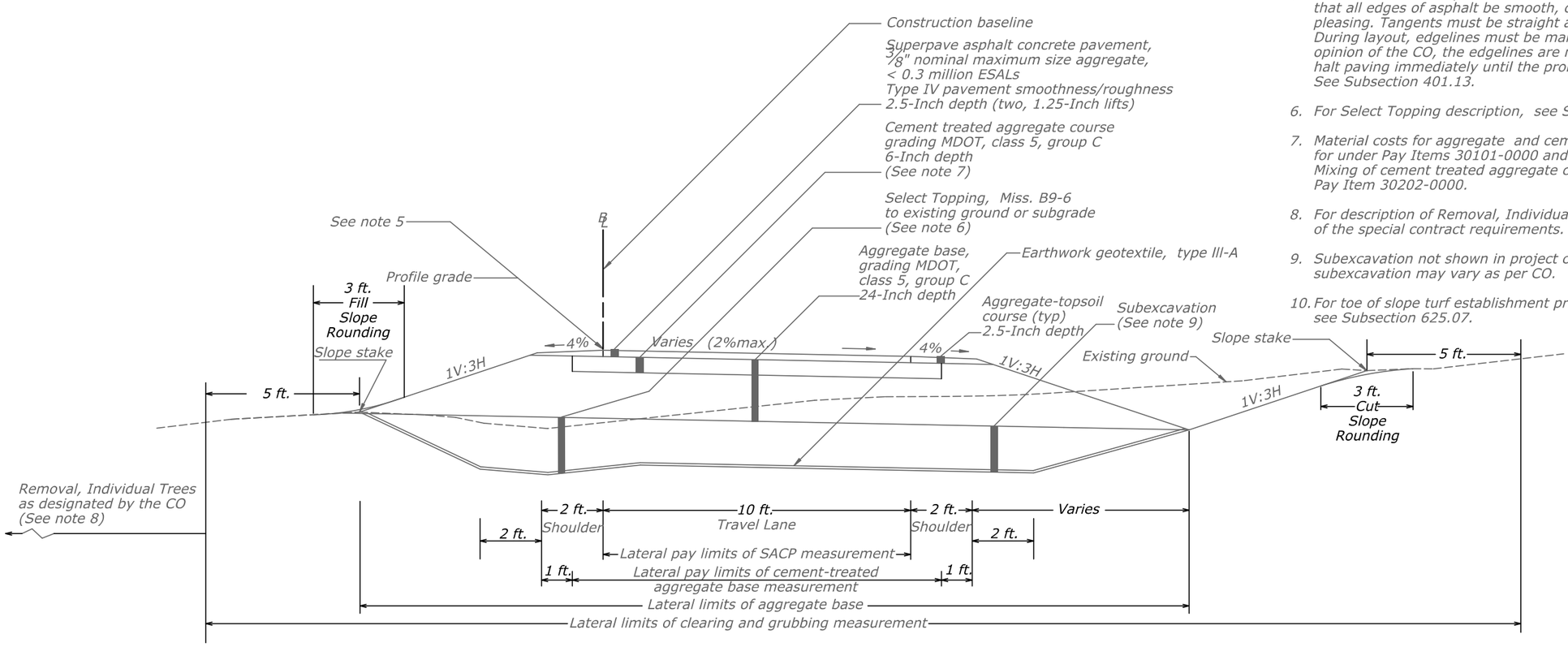
FHWA Location Maps

The FHWA Location Maps are 70% complete and subject to change. They have not yet been finalized for construction.

PMIS NO.	NPS NO.	REG	STATE	PROJECT	SHEET NO.
55898-3P20	604 111,682	SE	MS	PRA-NATR 3P20	A4

Notes:

1. Cement-treated base consists of 4% by weight of ordinary portland cement.
2. Provide minimum ditch grades of 0.5%. Adjust ditches to provide for proper drainage as directed by the CO.
3. 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.
4. No payment will be made for SACP and cement-treated base outside the lateral limits of measurement for each item.
5. Because of the low speed nature of the bike trail, it is critical that all edges 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 401.13.
6. For Select Topping description, see Subsection 704.08.
7. Material costs for aggregate and cement are paid for under Pay Items 30101-0000 and 30205-0000, respectively. Mixing of cement treated aggregate course is paid for under Pay Item 30202-0000.
8. For description of Removal, Individual Trees, see Subsection 202.07 of the special contract requirements.
9. Subexcavation not shown in project cross sections. Depth of subexcavation may vary as per CO.
10. For toe of slope turf establishment procedures in wetland areas, see Subsection 625.07.



MULTI-USE TRAIL
(50+00 to 96+00 and 106+75 to 117+50.12)
AND
OSBURN STAND PA CONNECTOR
(1+00 to 1+86.00)

0 2 4
SCALE IN FEET

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

NATCHEZ TRACE PARKWAY

TYPICAL SECTION

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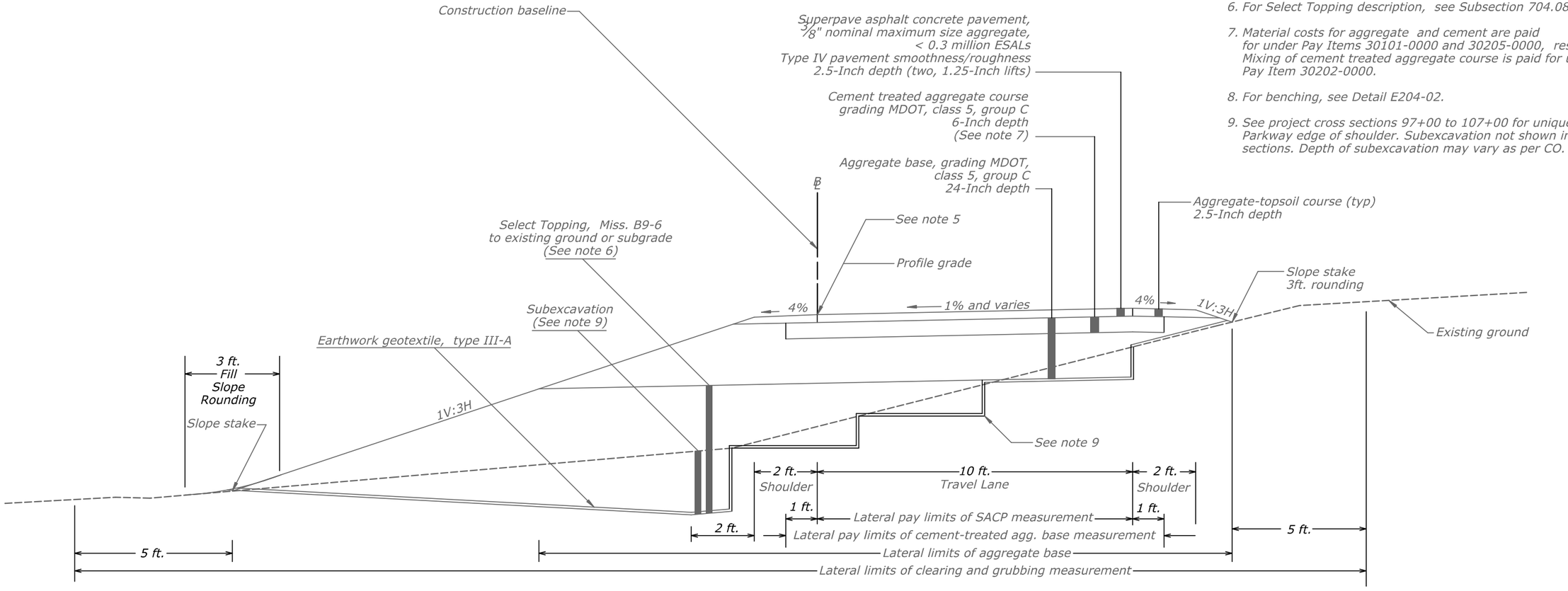
PMIS NO.	NPS NO.	REG	STATE	PROJECT	SHEET NO.
55898-3P20	604 111,682	SE	MS	PRA-NATR 3P20	A5

Notes:

1. Cement-treated base consists of 4% by weight of ordinary portland cement.
2. Provide minimum ditch grades of 0.5%. Adjust ditches to provide for proper drainage as directed by the CO.
3. 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.
4. No payment will be made for SACP and cement-treated base outside the lateral limits of measurement for each item.
5. Because of the low speed nature of the bike trail, it is critical that all edges 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 401.13.
6. For Select Topping description, see Subsection 704.08.
7. Material costs for aggregate and cement are paid for under Pay Items 30101-0000 and 30205-0000, respectively. Mixing of cement treated aggregate course is paid for under Pay Item 30202-0000.
8. For benching, see Detail E204-02.
9. See project cross sections 97+00 to 107+00 for unique tie into Parkway edge of shoulder. Subexcavation not shown in project cross sections. Depth of subexcavation may vary as per CO.



MULTI-USE TRAIL
(96+00 to 98+50)
and
(103+00 to 106+75)

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

NATCHEZ TRACE PARKWAY

TYPICAL SECTION
(bridge approaches)

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PMIS NO.	NPS NO.	REG	STATE	PROJECT	SHEET NO.
55898-3P20	604 111,682	SE	MS	PRA-NATR 3P20	D1

NOTE: Hatched areas represent approximate wetlands.

BEGIN PROJECT
NATR 3P20, 50+00.00
N 1050602.3573
E 2320414.9848

Future trail NATR 3P21

Install Osburn Stand Parking Area Connector

Install 42" culvert, headwalls (D1)

Install 30" culvert, headwalls (D2)

Baseline

Edge of Pavement

POT 50+00.00
PC 50+10.00
PT 54+12.04
PC 56+09.91
PT 57+32.03
PC 58+05.49
60+00
PT 60+16.15
PC 61+92.46
PT 67+51.70
70+00
PC 70+00.89
PT 71+79.19
PC 72+74.32
PT 74+07.22
PC 77+24.41
POT 1+00.00
PC 1+13.26
PT 1+84.90

NATCHEZ TRACE PARKWAY

R/W

WETLANDS
- PFOI Palustrine Forested
- R2EM2 Riverine Emergent
- PEMI Palustrine Emergent
- PSSI Palustrine Scrub Shrub

0 100 200
SCALE IN FEET

2% RT | 2% LT | 2% RT | 2% LT | 2% RT | 2% LT

trans: 54+85.95 / 55+35.98; 57+43.76 / 57+93.76; 60+79.31 / 61+29.31; 68+51.30 / 69+01.30; 72+01.78 / 72+51.78

50+00 312.50
VPI 53+10 EL 326.30
VPI 56+80 EL 308.30
VPI 59+10 EL 304.80
VPI 61+00 EL 309.80
VPI 64+30 EL 316.00
VPI 71+00 EL 311.80

+4.452% | 400' VC | -4.865% | 160' VC | -1.522% | 270' VC | +2.632% | 100' VC | +1.879% | 450' VC | -0.627% | 350' VC | +3.461%

Profile grade

Existing ground

MP 93.70
MP 93.75
MP 94.00

D1
59+00
42" Culvert
Headwalls
Inv. el. = 300.42

D2
71+16.50
30" Culvert
Headwalls
32 deg. skew LF
Inv. el. = 308.26

350 340 330 320 310 300 290 280

50+00 55+00 60+00 65+00 70+00 75+00

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

NATCHEZ TRACE PARKWAY

PLAN AND PROFILE

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PMIS NO.	NPS NO.	REG	STATE	PROJECT	SHEET NO.
55898-3P20	604 / 111,682	SE	MS	PRA-NATR 3P20	D2

NOTE: Hatched areas represent approximate wetlands.

Edge of Pavement

Baseline

D3 Install 6' span x 4' rise box culvert, headwalls

Install 8' span x 8' rise box culvert (agricultural underpass) headwalls D4

D5 Install 24" culvert, headwalls

Existing underground electric

Install paved waterway 94+20 to 95+00

PT 71+79.19

PC 72+74.37

PT 74+07.22

PC 77+24.41

PT 80+93.45

PC 81+99.92

PT 85+92.75

PC 87+08.61

PT 95+70.59

SYC

PC 96+90.45

PT 98+44.68

80+00

90+00

100+00

R/W

NATCHEZ TRACE PARKWAY

HILDA DRIVE

ILLINOIS CENTRAL RAILROAD

0 100 200
SCALE IN FEET

2% LT trans 75+00 75+40.82 75+90.82

2% RT trans 81+21.69 81+71.69

2% LT trans 86+25.68 86+75.68

2% RT trans 96+05.32 96+55.32

1% LT 100+00

390 380 370 360 350 340 330 320

VPI 76+75 EL 331.70

285' VC

-3.229%

240' VC

+2.336%

D3 81+33 6' span x 4' rise Box Culvert 26 deg. skew LB Inv. el. = 310.50

D4 83+00 8' span x 8' rise Agricultural Underpass Inv. el. = 315.59

VPI 80+25 EL 320.40

MP 94.25

VPI 86+50 EL 335.00

Profile grade

600' VC

+0.704%

180' VC

+4.900%

VPI 90+90 EL 336.10

D5 91+50 24" Culvert Headwalls Inv. el. = 335.84

MP 94.50

Existing ground

VPI 97+35 EL 369.70

+1.205%

160' VC

VPI 98+96 EL 371.64

162.2' VC

+0.700%

Begin bridge (99+18, 371.794)

End bridge (102+98, 374.461)

99+96.72 Existing underground telephone line (approx. location)

102+41.16 Existing underground 6" dia. gas line (approx. location)

** Use

75+00 80+00 85+00 90+00 95+00 100+00

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NATCHEZ TRACE PARKWAY

PLAN AND PROFILE

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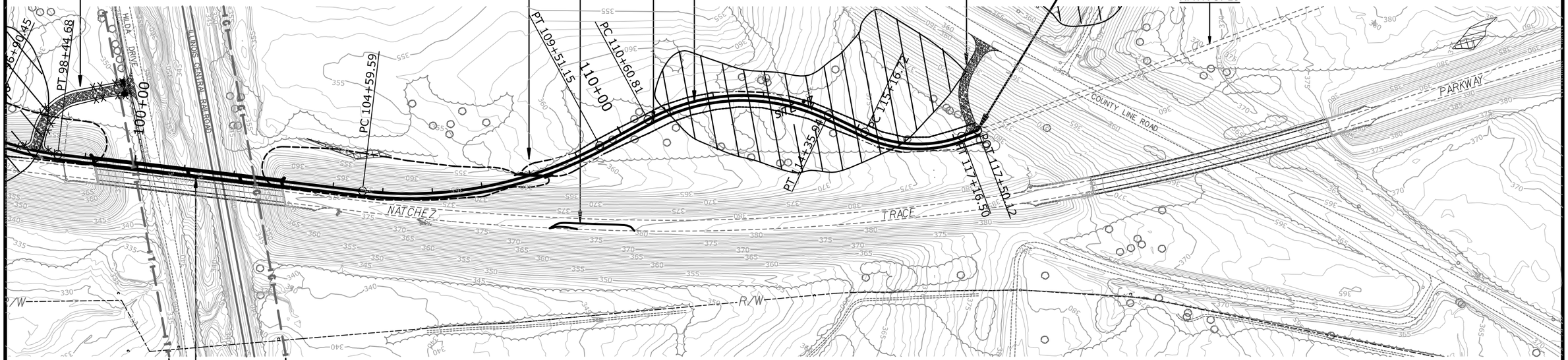
PMIS NO.	NPS NO.	REG	STATE	PROJECT	SHEET NO.
55898-3P20	604 / 111,682	SE	MS	PRA-NATR 3P20	D3

Install stabilized construction entrance (obliterate at end of project)
Install 30ft metal gate (remove at end of project)
Install barbed wire fence (remove at end of project)
Install silt fence (remove at end of project)

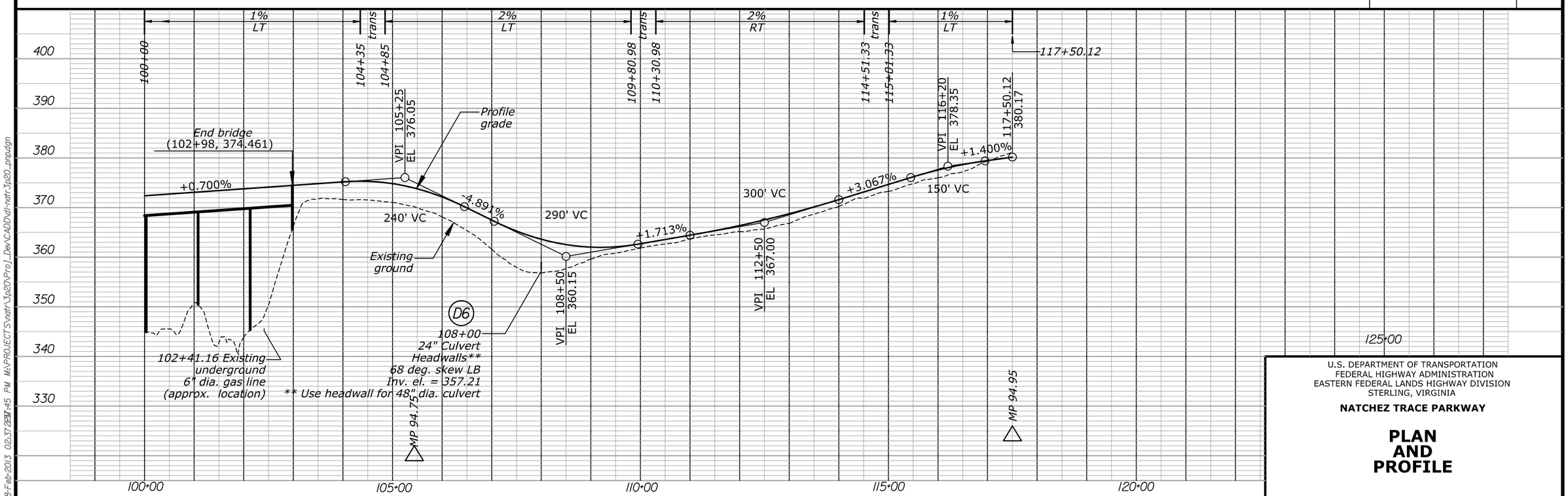
Obliterate existing west stabilized construction entrance from NATR 3P19 project after completion of NATR 3P20
Remove barbed wire fence
Remove 30ft metal gate
Remove silt fence

END PROJECT
NATR 3P20, 117+50.12 =
50+00 NATR 3P19

NOTE:
Hatched areas represent approximate wetlands.



0 100 200
SCALE IN FEET



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

NATCHEZ TRACE PARKWAY

PLAN AND PROFILE

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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.

National Park Service 604/120254

January 2013

United States Department of the Interior ✧ National Park Service