Southwest Creek Mitigation Plan

NC 11 Bypass of Deep Run, Lenoir County
TIP No. R-2001B

Project Development and Environmental Analysis Branch
North Carolina Department of Transportation

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1.0 Introduction

The North Carolina Department of Transportation (NCDOT) proposes to upgrade NC 11 in Lenoir County from 0.2 miles south of Deep Run Creek to SR 1152. Section R-2001B is a 2.68 mile bypass on new location from just south of Deep Run Creek to SR 1158 and will be a four-lane roadway with a 46 foot wide median.

NC 11, a major rural collector, has been identified by the NCDOT as a "critical connector" from I-40 near Kenansville to the Virginia State border passing through Kinston and Greenville and connecting three intrastate corridors. The proposed project improvements are scheduled in conjunction with two other projects (R-2204 and R-2211) forming the southern leg of the connector. R-2211 extends from I-40 to NC 24 and bypasses Kenansville. R-2204 completes the Kenansville Bypass between NC 24 and existing NC 11 and extends to SR 1110, providing a bypass of Pink Hill.

1.1 Wetland Resources

Wetlands were delineated by Mr. Logan Williams on February 26, 1996 using the "Corps of Engineers Wetlands Delineation Manual" (1987). The delineation was verified by the US Army Corps of Engineers on April 2, 1996.

Impacts on jurisdictional areas of Section R-2001B consist of a total of 5.95 acres of permanent wetland impacts which consist of 4.92 acres of fill, 0.17 acres of excavation, and 0.86 acres due to mechanized clearing. There will also be 0.35 acres of fill in surface waters. There will be approximately 2,149 linear feet of jurisdictional stream impacts.

1.2 Summary of Mitigation

Avoidance and minimization measures taken during the project planning, review, and design phases are described in the permit application for TIP No. R-2001B dated August 6, 1999.

Wetland compensation for R-2001B will be accomplished through three resources. The Gurley Mitigation Site is proposed for providing 4.92 credits of bottomland hardwood restoration to offset 2.34 acres of impacts associated with R-2001B. Payment into the Wetlands Restoration Program is proposed to offset 2,149 feet of jurisdictional stream impact associated with R-2001B. The remainder of the wetland impacts will be compensated through on-site restoration of 3.61 acres by removal of the existing bridge and causeway on NC 11 and the associated fill in the Southwest Creek floodplain.

2.0 Southwest Creek Mitigation Site

The purpose of this report is to document the existing site conditions at Southwest Creek at the NC 11 crossing, to describe the wetland restoration, and to establish the restoration monitoring for the Southwest Creek Mitigation Plan. This plan includes on-site wetland restoration associated with the NC 11 causeway and enhancement of the wetlands adjacent to NC 11, known as the Grady property. As described earlier, the 3.61 acres of on-site wetland restoration is proposed as mitigation for R-2001B. The Grady property will provide 43.10 acres of wetland enhancement to be used as mitigation for other projects in the area.

2.1 Site Description

The existing causeway for the bridge over Southwest Creek on NC 11 is 1312 feet long and 120 feet wide. The area adjacent to the causeway, also known as the Grady Property is characterized by three wetland community types: freshwater marsh, cypress-gum swamp, and scrub/shrub wetland.. The wetland area grades upslope into a shrub/scrub community, bordered to the north by an agricultural field. The change in slope across the site is from 72 feet above mean sea level (msl) near the creek to 98 feet above msl near the northwest corner of the site.

The freshwater marsh wetlands are located adjacent to the creek and characterized by herbaceous hydrophytic species such as pennywort (*Hydrocotyle* sp.), arrow arum (*Peltandra virginica*), greenbrier (*Smilax rotundifolia*), and cattail (*Typha latifolia*). Southwest Creek is braided into several channels in this area. The cypress-gum swamp occupies a small area behind the freshwater marsh. It is characterized by bald cypress (*Taxodium distichum*), swamp black gum (*Nyssa biflora*), and wax myrtle *(Myrica cerifera)*. The scrub/shrub wetlands are located further upslope from the cypress-gum swamp and characterized by red maple (*Acer rubrum*), sweet gum (*Liquidambar styraciflua*), black willow (*Salix nigra*), green ash (*Fraxinus pennsylvanica)* and yellow poplar (*Liriodendron tulipifera*). The shrub/scrub wetlands were logged 5 to 10 years ago and has grown back in an impenetrable thicket. The soils in the wetland area are mapped by the Soil Survey of Lenoir County (SCS, 1977) as Pamlico muck.

The upland shrub/scrub community is dominated by black cherry (*Prunus serotina*), sassafras (*Sassafras albidum*), red maple, yellow poplar, and sweetgum. In the agricultural field, upland weedy species are becoming established. The dominant soils are mapped as Wagram loamy sand 0 to 6 percent slopes (SCS, 1977).

2.2 Methodology

The goal of the mitigation plan is to establish a wetland community described in Classification of Natural Communities of North Carolina (Shafale & Weakley, 1990) as a Coastal Plain Small Stream Swamp (Blackwater Subtype), bordered by a freshwater marsh along Southwest Creek.

The proposed Southwest Creek Mitigation Site will provide approximately 3.61 acres of on-site wetland restoration by removal of the existing bridge on NC 11 and the associated fill in the Southwest Creek floodplain (Figure 1). The material will be graded to the elevation of the surrounding natural terrain. The area will be disked and ripped as necessary to reduce compaction. The freshwater marsh zone will be stabilized with an annual seed mix, allowing for natural regeneration from volunteer hydrophytic vegetation in the adjacent marsh. The swamp zone will be planted with species typical of the target community in a random mix as listed in Table 1. The upland edge will be planted with a random mix of species as listed in Table 2. The planting will occur on 8 foot centers with a density of 680 trees per acre.

The Site will also provide approximately 43.10 acres of wetland enhancement on the Grady property (Figure 2). Wetlands on the Grady property were delineated by Mr. Frank Price and Mr. Ken Roeder of Resource Southeast, Inc. on July 14, 1998, using the "Corps of Engineers Wetlands Delineation Manual" (1987). The delineation was verified by the US Army Corps of Engineers on July 21, 1998.

The shrub/scrub wetland and upland shrub/scrub area will be drum chopped to remove the existing woody species. Multiple herbicide treatments will be applied as necessary to control resprouting of the woody vegetation. Replanting will occur after the second year of treatment with a random mix of tree species. The wetland area will be planted with species listed in Table 1. The upland buffer area will be planted with species listed in Table 2. The planting will occur on 8 foot centers with a density of 680 trees per acre. The marsh wetlands on either side of NC 11 will be reconnected by removal of the existing causeway. No additional treatment is proposed for the existing freshwater marsh area.

TABLE 1: Species Proposed for Wetland Planting

Common Name	Scientific Name	Southeast Region Indicator
Bald cypress	***Taxodium distichum***	**OBL**
Swamp chestnut oak	***Quercus michauxii***	**FACW-**
River birch	***Betula nigra***	**FACW**
Willow oak	***Quercus phellos***	**FACW-**
Laurel oak	***Quercus laurifolia***	**FACW**
Water oak	***Quercus nigra***	**FAC**

TABLE 2: Species Proposed for Upland Buffer Planting

Common Name	Scientific Name	Southeast Region Indicator
White oak	***Quercus alba***	**FACU**
Southern red oak	***Quercus falcata***	**FACU-**
Black cherry	***Prunus serotina***	**FACU**
Bitternut hickory	***Carya cordiformis***	**FAC**
Yellow poplar	***Liriodendron tulipfera***	**FAC**
Water oak	***Quercus nigra***	**FAC**

2.3 Monitoring

Hydrologic monitoring will occur throughout the growing season in the wetland areas. One surface gauge will be placed in the restored marsh area and two in the existing marsh area. Success will be determined using data from the surface gauges to demonstrate that patterns of flooding or inundation in the existing marsh are replicated in the restored marsh area. Vegetation monitoring will be based on visual observation of plant establishment and recorded using photo reference points.

In the swamp area, six 40-inch groundwater wells will be placed across the restored and enhanced wetlands. Success will be based on saturation or inundation within 12 inches of the soil surface for a consecutive 12.5% of the growing season during years of normal rainfall. Vegetation monitoring consists of six plots in the enhanced swamp area and two plots in the restored swamp area. Stem count, species composition, and plant health will be recorded annually at the end of the growing season. Success will be based on survival of 320 trees per acre in year three with a target survival of 260 trees per year in year five.

2.4 Mitigation Credit Ratios

The following table outlines the credit ratios and calculations for available wetland mitigation at the Southwest Creek Mitigation Site. Of these credits, 3.61 credits of on-site restoration are proposed for mitigation of impacts for R-2001B. The remainder of 10.78 credits (4:1 ratio for enhancement) is available for mitigation of other projects in the area.

Community Type	On-Site Acres / 1:1 ratio Credits	Grady Property Acres / 4:1 ratio Credits	Total
Freshwater Marsh	**1.03 / 1.03**	**6.10 / 1.53**	**7.13 / 2.56**
Coastal Plain Small Stream Swamp	**2.58 / 2.58**	**37.00 / 9.25**	**39.58 / 11.83**
Total	**3.61 / 3.61**	**43.10 / 10.78**	**46.71 / 14.39**

2.5 Final Dispensation of Property

NCDOT will retain ownership of the mitigation site until all monitoring requirements are fullfilled and an appropriate recipient is identified. If and when the deed is transferred, restrictions will be placed on the property to ensure protection in perpetuity.