

Cumberland County  
Bridge No. 80 on SR 1108  
Over Little Rockfish Creek  
Federal-Aid Project No. BRZ-1108(9)  
State Project No. 8.2444001  
WBS No. 33450.1.1  
TIP No. B-4092

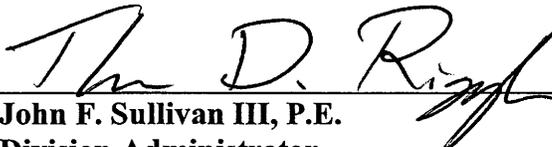
Categorical Exclusion  
United States Department of Transportation  
Federal Highway Administration  
And  
North Carolina Department of Transportation

Approved:

4/11/06  
Date

  
for Gregory J. Thorpe, Ph.D.  
Environmental Management Director  
Project Development and Environmental Analysis Branch  
North Carolina Department of Transportation

4/11/06  
Date

  
for John F. Sullivan III, P.E.  
Division Administrator  
Federal Highway Administration

Cumberland County  
Bridge No. 80 on SR 1108  
Over Little Rockfish Creek  
Federal-Aid Project No. BRZ-1108(9)  
State Project No. 8.2444001  
WBS No. 33450.1.1  
TIP No. B-4092

Categorical Exclusion

April 2006

Document Prepared by:

THE LPA GROUP OF NORTH CAROLINA, P.A.

  
Richard B. Davis, P.E.  
Project Manager

4/6/06



For the North Carolina Department of Transportation

  
Vincent J. Rhea, P.E.  
Project Development Engineer

## PROJECT COMMITMENTS

**Cumberland County  
Bridge No. 80 on SR 1108  
Over Little Rockfish Creek  
Federal-Aid Project No. BRZ-1108(9)  
State Project No. 8.2444001  
WBS No. 33450.1.1  
TIP No. B-4092**

In addition to the standard Nationwide Permit #23 and #33 Conditions, the General Nationwide Permit Conditions, Section 404 Conditions, Regional Conditions, State Consistency Conditions, NCDOT's Guidelines for Best Management Practices for the Protection of Surface Waters, NCDOT's Guidelines for Best Management Practices for Bridge Demolition and Removal, General Certification Conditions, and Section 401 Conditions of Certification, the following special commitments have been agreed to by NCDOT:

Project Development and Environmental Analysis, Human Environment Unit,  
Archaeology, Division Construction Engineer

The State Historic Preservation Office has requested an archaeological survey. The survey would identify and evaluate the significance of archaeological remains that may be impacted by the proposed project. An archaeological survey will be performed to assess potential effects on unknown resources prior to the initiation of construction activities.

**Cumberland County**  
**Bridge No. 80 on SR 1108**  
**Over Little Rockfish Creek**  
**Federal-Aid Project No. BRZ-1108(9)**  
**State Project No. 8.2444001**  
**WBS No. 33450.1.1**  
**TIP No. B-4092**

**Table of Contents**

	<b>Page Number</b>
Project Commitments	1
Introduction	1
I. Purpose and Need Statement	1
II. Existing Conditions	1
III. Alternatives	2
A. Project Description	2
B. Build Alternatives	3
C. Alternatives Eliminated from Further Study	4
D. Preferred Alternative	4
IV. Estimated Costs	4
V. Natural Resources	5
A. Methodology	5
B. Physiography and Soils	6
C. Water Resources	7
1.0 Waters Impacted	7
2.0 Water Resource Characteristics	7
2.1 Best Usage and Water Quality Classification	7

2.2 Macroinvertebrate Monitoring	8
2.3 North Carolina Index of Biotic Integrity	8
2.4 Section 303(d) Waters	8
2.5 Permitted Dischargers	8
2.6 Non-Point Source Discharges	8
3.0 Anticipated Impacts to Water Resources	8
3.1 Impacts Related to Bridge Demolition and Removal	9
D. Biotic Resources	9
1.0 Terrestrial Communities	10
1.1 Disturbed-Maintained Communities	10
1.2 Pine Scrub/Oak Sandhill	10
1.3 Mesic Mixed Hardwood Forest (Coastal Plain Subtype)	10
1.4 Wetland Communities	11
2.0 Wildlife	11
2.1 Terrestrial Wildlife	11
3.0 Aquatic Community	12
3.1 Aquatic Wildlife	12
4.0 Anticipated Impacts to Biotic Communities	12
4.1 Terrestrial Communities	12
4.2 Wetland Communities	13
4.3 Aquatic Communities	14
E. Special Topics	15
1.0 Waters of the United States	15

1.1 Wetlands	15
1.2 Jurisdictional Streams	15
2.0 Permits and Certifications	15
2.1 Section 404	15
2.2 Water Quality Certification	15
3.0 Mitigation	16
F. Protected Species	17
1.0 Species Under Federal Protection	17
2.0 Federal Species of Concern	24
VI. Cultural Resources	26
A. Compliance Guidelines	26
B. Historic Architecture	26
C. Archaeology	26
VII. Section 4(f) Resources	26
VIII. Environmental Effects	27
IX. Public Involvement	29
X. Agency Comments	29

<b>LIST OF TABLES</b>	
Table 1. Estimated Cost per Alternative	4
Table 2. Terrestrial Communities Occurring within the B-4092 Study Area	13
Table 3. Anticipated Impacts to Waters of the United States	14
Table 4. Federally Protected Species Listed for Cumberland County, NC	17

Table 5. Federal Species of Concern (FSC) Listed for Cumberland County, NC	25
--	----

**Cumberland County**  
**Bridge No. 80 on SR 1108**  
**Over Little Rockfish Creek**  
**Federal-Aid Project No. BRZ-1108(9)**  
**State Project No. 8.2444001**  
**WBS No. 33450.1.1**  
**TIP No. B-4092**

**INTRODUCTION:** The replacement of Bridge No. 80 is included in the North Carolina Department of Transportation (NCDOT) 2006-2012 Transportation Improvement Program and in the Federal-Aid Bridge Replacement Program. The location is shown on Figure 1. No substantial environmental impacts are anticipated. The project is classified as a Federal "Categorical Exclusion."

**I. PURPOSE AND NEED**

The NCDOT Bridge Maintenance Unit records indicate the bridge has a sufficiency rating of 4.0 out of a possible 100. The bridge is considered to be structurally deficient and functionally obsolete. The replacement of this inadequate structure would result in safer and more efficient traffic operations.

**II. EXISTING CONDITIONS**

The project is located in Cumberland County on SR 1108, approximately one mile southwest of its junction with SR 1107 (Figure 1). The surrounding land use includes residential properties, forested areas, wetlands, and a golf course.

Bridge No. 80 was constructed in 1951 and currently has a posted weight limit of 17 tons for single vehicles and 25 tons for truck tractors with semi trailers (TTST). The overall length of the four span bridge is 70 feet with a bed to crown height of 10 feet. It has a clear roadway width of 24 feet carrying two travel lanes. Bridge No. 80 has a reinforced concrete deck on timber joists supported by a substructure consisting of timber piles with timber caps. Crutch piles have been added to the structure for additional support.

In the vicinity of the bridge, SR 1108 is a 22-foot, two-lane roadway with 4-foot unpaved shoulders. The existing bridge is in a horizontal tangent and is skewed 90 degrees to the roadway. The north approach is in tangent with good sight distance. The south approach is also in tangent with a curve beginning approximately 300 feet from the end of the bridge with fair sight distance. The vertical grade for the south approach falls toward the bridge and continues to fall north across the bridge to a sag located approximately 200 feet from the north end of the bridge. The speed limit is posted at 45 miles per hour (mph) and SR 1108 is classified as an Urban Local in the Statewide Functional Classification System.

The current (2006) traffic volume of 13,700 vehicles per day (vpd) is expected to increase to 23,800 vpd by the year 2025. These volumes include 3 percent dual tired vehicles and 1 percent TTSTs.

Two crashes were reported in the vicinity of the bridge during a recent three-year period. Both of the crashes involved southbound drivers hitting the bridge guardrail. One of the crashes resulted in a non-fatal injury and the other was property damage only.

There are no utilities attached directly to the structure; however there are overhead power transmission lines and underground telephone lines (overhead at the bridge) along the west side of SR 1108. An underground fiber optic line and a 12-inch water line are located along the east side of the roadway.

The bridge is located between Jack Britt High School with approximately 1,800 students and John Griffin Middle School with 1,100 students and there are two elementary schools in close proximity to the bridge. According to Phillip Molland of the Cumberland County School bus garage there are currently 82 school bus crossings per day. In a letter dated August 26, 2002, the Executive Director of Transportation for the Cumberland County Schools stated that the school community would be severely disrupted unless there is an on-site detour used during construction activities.

The studied route does not contain any bicycle accommodations, nor is it a designated bicycle route; therefore, no bicycle accommodations have been included as part of this project.

A letter dated August 31, 2004 was sent to the Cumberland County Emergency Management Agency soliciting comments on the possible alternatives for the proposed bridge replacement. No response was received regarding which alternative the Emergency Management Agency would prefer.

### **III. ALTERNATIVES**

#### **A. Project Description**

The proposed project would consist of the replacement of Bridge No. 80 on SR 1180 over Little Rockfish Creek, with a wider and safer structure. This bridge replacement would result in safer and more efficient traffic operations.

Based on a preliminary hydraulic analysis that was conducted in conjunction with a field reconnaissance of the site, the proposed replacement structure for Bridge No. 80 would be a 90-foot long bridge. The replacement bridge would provide a clear roadway width of 40 feet, carrying two 12-foot wide travel lanes with 8-foot offsets (Figure 3B).

The roadway approaches would provide two 12-foot travel lanes, 4-foot paved shoulders, and a total shoulder width of 8 feet (Figure 3A). The vertical roadway grade would be approximately the same as the existing grade. The design speed of the roadway approaches would be 55 mph, with a posted speed limit of 45 mph.

**B. Build Alternatives**

There are three alternatives for the replacement of Bridge No. 80, which are outlined below:

**Alternative 1**

Alternative 1 would replace the existing bridge with a new structure constructed in the same location as the existing bridge (Figures 2A and 2B). The approach work would start 370 feet south of the bridge and 240 feet north of the bridge for a total length (including the bridge) of 700 feet. During construction, traffic would be maintained using an off-site detour (Figure 1) with a shortened construction period. Traffic would be detoured on SR 1107 (Fisher Road), SR 1104 (Strickland Bridge Road), SR 1109 (Dundle Road), and SR 1100 (Stoney Point Road). There is one bridge (Bridge No. 78) on the proposed detour, which is posted 19 tons for single vehicles and 25 tons for TTSTs. The detour is approximately 7.0 miles long. In order to avoid disrupting school bus operations, the bridge would need to be replaced during the summer vacation period. However, it was determined that this time period is not adequate for the removal of the existing bridge and the construction of the new bridge and its approaches. Routing the heavy traffic from SR 1108 over these other secondary roads would likely result in increased congestion during the construction period. With an additional travel time of 15 minutes, the delay for this off-site detour is considered to be justifiable from a traffic operations standpoint under NCDOT guidelines if the detour period can be held to under six months.

**Alternative 2**

Alternative 2 would replace the existing bridge with a new structure constructed in the same location as the existing bridge (Figures 2A, 2B, and 2C). Alternative 2 would utilize a temporary on-site detour on the east side of the existing bridge to maintain traffic flow during construction. Permanent approach work would extend from 370 feet south of the bridge and 240 feet north of the bridge for a total length (including the bridge) of 700 feet. The detour structure would be located approximately 40 feet, centerline to centerline, east of the existing bridge and provide a clear roadway width of 30 feet and would carry two 12-foot travel lanes with 3-foot offsets (Figure 3B). The detour roadway approaches would provide two 12-foot travel lanes and 8 foot unpaved shoulders (Figure 3A). The design speed of the detour approaches is 40 mph, with a posted speed limit of 35 mph. The total length of the temporary detour would be approximately 950 feet.

**Alternative 3**

Alternative 3 replaces the existing bridge with a new structure constructed in the same location as the existing bridge (Figure 2A). Alternative 3 would utilize a temporary on-site detour on the west side of the existing bridge to maintain traffic flow during

construction. Permanent approach work would extend 370 feet south of the bridge and 240 feet north of the bridge for a total length (including the bridge) of 700 feet. The detour bridge would be located approximately 45 feet, centerline to centerline, west of the existing bridge and provide a clear roadway width of 30 feet and would carry two 12-foot travel lanes with 3-foot offsets (Figure 3B). The detour roadway approaches would provide two 12-foot travel lanes and 8 foot unpaved shoulders (Figure 3A). The design speed of the detour approaches is 40 mph, with a posted speed limit of 35 mph. The total length of the temporary detour would be approximately 1,000 feet.

**C. Alternatives Eliminated from Further Study**

The “Do-Nothing” alternative was eliminated from further study because the existing bridge is considered to be functionally obsolete and structurally deficient. Over time the bridge would continue to deteriorate, and this would eventually lead to the closing of the bridge. Due to daily traffic flow considerations, the Do-Nothing alternative is not an option.

**D. Preferred Alternative**

Alternative 2, replacing the bridge in its existing location and utilizing a temporary on-site detour to the east is the preferred alternative. Alternative 2 was selected because the off-site detour was not compatible with school bus traffic, the high daily traffic volume, and since it is unlikely that construction could be completed when school is out for summer vacation. Additionally, Alternative 2 minimizes costs and impacts to natural resources when compared to Alternative 3. Plan sheets for the Preferred Alternative are included in Figures 2B and 2C.

**IV. ESTIMATED COSTS**

The estimated costs for each alternative, based on current dollars, are shown below:

**Table 1. Estimated Project Costs**

	<b>ALT 1</b>	<b>ALT 2 (Preferred Alternative)</b>	<b>ALT 3</b>
Roadway Approaches	\$162,360	\$393,465	\$410,365
Proposed New Bridge	\$306,000	\$306,000	\$306,000
Temporary Structure	\$0	\$84,000	\$84,000
Structure Removal	\$19,800	\$19,800	\$19,800
Misc. & Mobilization	\$121,840	\$238,735	\$246,835
Engineering & Contingencies	\$90,000	\$158,000	\$183,000
<b>Total Construction Costs</b>	<b>\$700,000</b>	<b>\$1,200,000</b>	<b>\$1,250,000</b>
Right of Way and Utilities	\$26,000	\$36,400	\$75,000
<b>Total Project Cost</b>	<b>\$726,000</b>	<b>\$1,236,400</b>	<b>\$1,325,000</b>

The estimated cost of the project as shown in the 2006-2012 NCDOT Transportation Improvement Program is \$945,000 including \$150,000 spent in prior years, \$70,000 for right-of-way and \$725,000 for construction.

## **V. NATURAL RESOURCES**

### **A. Methodology**

Published information and resources were collected prior to the field investigation. Information sources used to prepare this report included the following:

- United States Geological Survey (USGS) 7.5 minute quadrangle maps (Parkton, NC 1981 Hope Mills, NC 1986, Fayetteville, NC 1987, and Clifdale, NC 1981)
- NCDOT aerial photograph of the project area (2001)
- Soil maps and descriptions of the soils found in the project area (Cumberland and Hoke Counties Soil Survey, Natural Resources Conservation Service [NRCS] 1984)
- North Carolina Division of Water Quality (DWQ) basin-wide assessment information (DWQ 2002)
- United States Fish and Wildlife Service (USFWS) list of protected and candidate species (USFWS 2003)
- North Carolina Natural Heritage Program (NCNHP 2004) files of rare species and unique habitats

Water resources information was obtained from data posted on the Internet by DWQ.

The USFWS provided a list of threatened and endangered species known to occur in Cumberland County on December 30, 2003 (updated March 14, 2006), prior to the field investigation. Information concerning species under state protection was obtained from the NCNHP database of rare species and unique habitats. NCNHP files were reviewed for known locations of listed species and significant natural areas on March 29, 2004.

A field investigation was conducted within the project study area by THE LPA GROUP of North Carolina, p.a. (LPA) biologists on June 10, 2004. The project vicinity is an area extending 0.5-mile from the study area. The study area for B-4092 extends approximately 700 feet north of the existing bridge and approximately 700 feet south of the existing bridge (approximately 0.25 miles), and encompasses a 200-foot wide corridor centered along the existing centerline of SR 1108.

Water resources were identified, and their physical characteristics were recorded. For the purposes of this study, a habitat assessment was performed within the project study area. Plant communities and their associated wildlife were identified using a variety of observation techniques, including active searching, visual observations, and identification

of characteristic signs of wildlife (sounds, tracks, scats, and burrows). Terrestrial community classifications generally follow Schafale and Weakley (1990), where appropriate; and plant nomenclature follows Radford *et al.* (1968). Biotic communities were mapped using sub-meter accuracy Global Positioning System (GPS) equipment and aerial photography of the project site. Vertebrate nomenclature follows Potter *et al.* (1980), Martof *et al.* (1980), Rhode *et al.* (1994), the American Ornithologists' Union (2001), and Webster *et al.* (1991).

Jurisdictional areas were identified using the three-parameter approach (hydrophytic vegetation, hydric soils, wetland hydrology) established in the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987). The boundaries of the jurisdictional areas were flagged and mapped in the field using sub-meter accuracy GPS equipment. Jurisdictional wetland areas were characterized according to the classification scheme established by Cowardin *et al.* (1979).

## **B. Physiography and Soils**

The project study area is located within the Coastal Plain physiographic province of North Carolina. The topography is sloping to nearly level surfaces. Elevations range from approximately 125 to 130 feet above mean sea level (USGS 1981). Surrounding land uses include a golf course, residential areas, and forested land.

According to the Soil Survey of Cumberland and Hoke Counties General Soils Map, the project study area is located within an area mapped as Lakeland-Candor-Blanney soil association (NRCS 1984). Soil associations contain one or more map units occupying a unique natural landscape. Detailed map units are named for the major soil series within the unit, but may contain minor inclusions of other soil series. The soil survey describes Lakeland-Candor-Blanney soil association as nearly level to strongly sloping, excessively drained to well-drained soils, which are sandy throughout or have a loamy subsoil that may be brittle on uplands. This unit is found in the southwestern part of Cumberland County near Hope Mills. The unit occurs on broad ridges and long side slopes.

There are five detailed map units within the project study area, including:

- Bragg sandy loam, (*Typic Udorthents*), 1 to 4 percent slopes;
- Candor Sand, (*Arenic Paleudults*), 1 to 8 percent slopes;
- Gilead loamy sand, (*Aquic Hapludults*), 2 to 8 percent slopes;
- Johnston loam, (*Cumulic Humaquepts*); and,
- Vaocluse loamy sand, (*Typic Hapludults*), 8 to 15 percent slopes.

Johnston loam is listed as a hydric soil in Cumberland County (USDA 1991).

## **C. Water Resources**

### **1.0 Waters Impacted**

The project study area is located in the 03-06-15 sub-basin of the Cape Fear River Basin (DWQ 2004a), and is part of USGS hydrologic unit 03030004 (EPA 2004). The study area includes one main body of water, Little Rockfish Creek. Little Rockfish Creek originates northwest of the study area and flows southeast to Rockfish Creek east of Hope Mills, in western Cumberland County. Little Rockfish Creek has been assigned Stream Index Number (SIN) 18-31-24-(4) (DWQ 2004b).

### **2.0 Water Resource Characteristics**

Little Rockfish Creek is a perennial stream with a moderate flow over a sand and silt substrate. Water clarity at the time of the site inspection was moderate, with the water being highly tannic. Little Rockfish Creek would provide a warm water habitat. The stream had a well-defined channel with stable tree-lined banks. No scour was observed at the bridge and the water depth at the bridge was estimated to be five to six feet. The channel width of Little Rockfish Creek was estimated to be approximately 30 feet, with a bankfull width of approximately 35 feet. The banks were steep and were estimated to be approximately 6 to 8 feet in height from the bed to top of the bank. Little Rockfish Creek had some meander on the upstream side of the bridge, and the study area encompasses slow moving runs and pools approximately 5 to 6 feet deep. A Rosgen analysis was not performed on Little Rockfish Creek. However, based on visual observations of stream morphology, the stream was assigned the stream type B5 (SRI 2005).

#### **2.1 Best Usage and Water Quality Characteristics**

Little Rockfish Creek has been assigned the Best Usage Classification of C (DWQ 2004b). The C indicates fresh waters that support aquatic life propagation and survival, fishing, wildlife, secondary recreation, and agriculture. Secondary recreation would include, wading, boating, and other uses involving human body contact with the water where such activities take place in an infrequent, unorganized, or incidental matter. There are no restrictions on watershed development or types of discharges (DWQ 2004c). Point source discharges of treated wastewater are permitted in these waters, pursuant to Rules .0104 and .0211 of 15A North Carolina Administrative Code (NCAC) 2B; local programs to control non-point source and stormwater discharge of pollution are required.

There are no Outstanding Resource Waters (ORW), High Quality Waters (HQW), or Sensitive Water Supply Watershed (WS-I or WS-II) waters within 3 miles up or downstream of the study area (DWQ 2004b). Little Rockfish Creek is not designated as a North Carolina Natural and Scenic River, or as a National Wild and Scenic River (NPS 2004).

## **2.2 Macroinvertebrate Monitoring**

There is a basinwide monitoring station approximately two miles east of the study area on Little Rockfish Creek at NC 59 (DWQ 2000a). This site was sampled in July of 1998 by DWQ and received a rating of Good (DWQ 2000a).

## **2.3 North Carolina Index of Biotic Integrity**

There is a DWQ Fish Monitoring Station located approximately three miles southwest of the study area on Puppy Creek at SR 1406 (DWQ 2000b). This site was sampled by DWQ on May 21, 1998, and received a rating of Good-Fair (DWQ 2000b).

## **2.4 Section 303(d) Waters**

None of the water resources within the project study area are designated as biologically impaired water bodies regulated under the provisions of the Clean Water Act (CWA) §303(d) (DWQ 2004d).

## **2.5 Permitted Dischargers**

There is one discharge within a five-mile radius of the study area. The discharge is located approximately five miles southwest, downstream of the study area and discharges into Rockfish Creek (DWQ 2000a).

## **2.6 Non-Point Source Discharges**

LPA biologists reviewed aerial photography and conducted a limited visual observation of potential NPS discharges located within and near the project study area. Atmospheric depositions from passing vehicles and fertilizers, herbicides, and insecticides from nearby residential roadways, as well as a golf course adjacent to the project study area were identified as potential sources of NPS pollution near the project study area.

## **3.0 Anticipated Impacts to Water Resources**

Short term impacts to water quality such as sedimentation and turbidity, may occur during construction related activities. Impacts from sedimentation and erosion would be minimized during construction by the use of a stringent erosion control schedule and the use of Best Management Practices (BMPs). The contractor would follow contract specifications pertaining to erosion control measures as outlined in 23 CFR 650 Subpart B and Article 107-13 entitled "Control of Erosion, Siltation, and Pollution pursuant to NCDOT's *Standard Specifications for Roads and Structures*." These measures include: the use of dikes, berms, silt basins, and other containment measures to control runoff and the elimination of construction staging areas in floodplains and adjacent waterways. Additional measures that could be taken to avoid water quality impacts would include keeping heavy equipment out of the stream channel, keeping staging areas out of wetlands, and also keeping live concrete out of the stream channel. After construction

activities are completed, abandoned approaches associated with the existing structure and/or temporary detours would be removed and revegetated in accordance with NCDOT guidelines.

Other impacts to water quality that would be anticipated as a result of this project include: changes in water temperature due to exposure to sunlight (from the removal of streamside vegetation), increased shade due to construction of new structures, and changes to stormwater flows due to changes in the amount of impervious surface adjacent to the stream channel. However, due to the limited amount of overall change in the surrounding areas, impacts would be expected to be temporary in nature.

Waters within the study area have been assigned a Best Usage Classification of C, which falls into the category of a Case III stream according to BMPs for Demolition and Removal (BMPs-BDRs). A Case III stream has no special restrictions other than those outlined in Best Management Practices for Protection of Surface Waters.

### **3.1 Impacts Related to Bridge Demolition and Removal**

Section 404-2 of NCDOT's *Standard Specifications for Roads and Structures* is labeled **Removal of Existing Structure**. This section outlines restrictions and Best Management Practices for Bridge Demolition and Removal (BMP-BDRs), as well as guidelines for calculating maximum potential fill in the creek resulting from demolition. These standards would be followed during the replacement of Bridge No. 80.

There is the potential that the superstructure could be dropped into Waters of the United States during demolition and removal of Bridge No. 80. The superstructure consists of a reinforced concrete floor on timber joists with a weather surface and concrete curbs. The maximum (worst case) resulting temporary fill associated with demolition activities would be approximately 50 cubic yards.

### **D. Biotic Resources**

Terrestrial and aquatic communities are included in the description of biotic resources. Systems described in the following sections refer to the dominant flora and fauna observed in each community during the field investigation. Descriptions of the terrestrial systems are presented in the context of plant community classifications. These classifications follow Schafale and Weakly (1990) where possible. Representative faunal species that are likely to occur in these habitats (based on published range distributions) are also cited. Scientific nomenclature and common names are used for the floral and faunal species described. Subsequent references to the same species are by the common name only. Fauna observed and/or heard (in the case of bird species) during field investigations are denoted with an asterisk (\*).

## **1.0 Terrestrial Communities**

Distribution and composition of plant communities throughout the project study area reflect landscape-level variations in topography, soils, hydrology, and past and present land use practices. The presence of SR 1108, past agriculture, development, and forestry practices have resulted in the present vegetation patterns. Four terrestrial plant communities occur within the study area: a disturbed-maintained community, pine/scrub oak sandhill, mixed mesic hardwood forest (coastal plain subtype), and a coastal plain small stream swamp (blackwater subtype). A description of each community type follows.

### **1.1 Disturbed-Maintained Communities**

Disturbed areas within the project study area have been combined into one general community type, described as a “disturbed-maintained community”. This community includes types of habitat that have recently been or are currently being impacted by human disturbance including regularly maintained road shoulders, a power-line right of way and residential areas. Photographs of these communities can be found in Appendix A. The majority of these habitats are kept in a low-growing or early successional state.

The power-line right-of-way and road shoulders had been recently cut at the time of field investigations and were dominated by various species of grasses.

### **1.2 Pine/Scrub Oak Sandhill**

Pine/scrub oak sandhill is found primarily in the Sandhills region, but occurs throughout the Coastal Plain in sandy areas. Generally, this forest type is found in rolling to more steeply sloping sandy Coastal Plain sediments with a clay layer near the surface, or with sandy to loamy well drained soils. This forest is on a steep, sandy, north facing slope that leads down to the floodplains of Little Rockfish Creek. Dominant canopy species observed included: mockernut hickory (*Carya tomentosa*), long-leaf pine (*Pinus palustris*), loblolly pine (*Pinus taeda*), blackjack oak (*Quercus marilandica*), turkey oak (*Quercus laevis*), and black cherry (*Prunus serotina*). Dominant understory/shrub species include: American holly (*Ilex opaca*), persimmon (*Diospyrus virginiana*), black gum (*Nyssa sylvatica*), and winged sumac (*Rhus copallina*). Dominant species observed in the herbaceous layer include: *Sassafras albidum*, dog fennel (*Eupatorium capillifolium*), *Solidago odora*, and *Hypericum* sp. Dominant woody vine species observed in the study area include wild grape (*Vitis* sp.) and poison oak (*Rhus toxicodendron*).

### **1.3 Mixed Mesic Hardwood Forest (Coastal Plain Subtype)**

Mixed mesic hardwood forest is found throughout the coastal plain in mesic upland areas protected from fire. It primarily occurs on north-facing river bluffs and ravine slopes, and occurs less commonly in upland flats or islands surrounded by peatland or swamp communities. This forest type occurs on various moist upland soils. The dominant tree

species on the north side of the existing bridge included: sweet gum, water oak (*Quercus nigra*), and loblolly pine. Additional species observed included: blueberry (*Vaccinium* sp.), red maple (*Acer rubrum*) seedlings, and poison oak.

### **1.3 Wetland Communities**

There are four wetlands (Wetlands A, B, C, and D) in the study area, and are all forested wetlands in the floodplain of Little Rockfish Creek. The dominant tree species in the canopies of the forested wetlands include: red maple, black gum, sweet gum, loblolly pine, and bald cypress (*Taxodium distichum*). Dominant understory/shrub species observed include: titi (*Cyrilla racemiflora*), button-bush (*Cephalanthus occidentalis*), and *Viburnum* var. *dentatum*. Dominant species observed in the herbaceous layer include: netted chain fern (*Woodwardia areolata*), and giant cane (*Arundinaria gigantea*). This community can be classified as a Coastal Plain Small Stream Swamp (Blackwater Subtype) according to Schafale and Weakly (1990).

### **2.0 Wildlife**

The study area was visually surveyed for signs of terrestrial and aquatic wildlife. Little wildlife was observed during the field investigation. A list of fauna likely to occur in the study area based on published ranges is also included.

#### **2.1 Terrestrial Wildlife**

Bird species observed or likely to occur in the study area included such species as the American robin (*Turdus migratorius*), American crow\* (*Corvus brachyrhynchos*), Carolina chickadee (*Parus carolinensis*), brown thrasher (*Toxostoma rufum*), catbird (*Dumetella carolinensis*), rufous-sided towhee (*Pipilo erythrophthalmus*), pileated woodpecker (*Dryocopus pileatus*), yellow-bellied sapsucker (*Sphyrapicus varius*), blue jay (*Cyanocitta cristata*), tufted titmouse (*Parus bicolor*), and golden crowned kinglet (*Regulus satrapa*).

Mammals observed or likely to occur in the study area include such species as eastern cottontail (*Sylvilagus floridanus*), white-tailed deer (*Odocoileus virginianus*), raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), gray squirrel (*Sciurus carolinensis*) and striped skunk (*Mephitis mephitis*). Beaver (*Castor canadensis*) activity was evident due to gnawed tree trunks in the study area.

Terrestrial reptiles observed or likely to occur in the study area include such species as garter snake (*Thamnophis sirtalis*), green anole (*Anolis carolinensis*), black rat snake (*Elaphe obsoleta*), milk snake (*Lampropeltis triangulum*), common king snake (*Lampropeltis getulus*), and eastern box turtle\* (*Terrapene carolina*).

Terrestrial amphibians likely to occur in the study area include such species as American toad (*Bufo americanus*), mud salamander (*Pseudotriton montanus*), northern cricket frog (*Acris crepitans*), and the four-toed salamander (*Hemidactylum scutatum*).

### **3.0 Aquatic Community**

The aquatic community consists of the stream channel and associated inundated wetlands. A visual survey of the stream and wetlands was conducted to document the aquatic communities. No aquatic vegetation was observed in the stream channel during the field assessment. Vegetation found in the wetland community is described in Section 1.3, *Wetland Communities*.

#### **3.1 Aquatic Wildlife**

Some of the fish species expected to occur in Little Rockfish Creek within the project vicinity include the mosquito fish (*Gambusia affinis*), creek chub (*Semotilus atromaculatus*), and the redbreast sunfish (*Lepomis auritus*).

Aquatic reptiles observed or expected to occur in the study area include such species as the snapping turtle (*Chelydra serpentina*), yellowbelly slider (*Trachemys scripta*), mud snake (*Farancia abacura*), and the banded water snake (*Nerodia fasciata*).

No aquatic amphibians were observed in the study area. Species expected to occur in the study area include the bull frog (*Rana catesbeiana*) and the pickerel frog (*Rana palustris*).

Potential habitat exists in the study area to support the wood duck (*Aix sponsa*), mallard (*Anas platyrhynchos*), great blue heron (*Ardea herodias*), and the Canada goose (*Branta canadensis*).

### **4.0 Anticipated Impacts to Biotic Communities**

Impacts to terrestrial and aquatic communities associated with the replacement of the existing bridge and related detours are discussed in the following sections.

#### **4.1 Terrestrial Communities**

Plant communities located within the study area total 5.72 acres (Table 2). These areas are based on an approximately 1,300-foot long study area with a width of approximately 200 feet, situated on the centerline of existing SR 1108.

**Table 2. Terrestrial Communities Occurring within the B-4092 Study Area**

		Potential Impacts (acres)					
		ALT 1		ALT 2 (Preferred Alternative)		ALT 3	
Plant Community	Area (acres)	Perm.	Temp.	Perm.	Temp.	Perm.	Temp.
Wetlands	0.16	None	None	None	None	None	None
Pine/Scrub Oak Sandhill	1.47	None	None	None	0.16	None	0.04
Mesic Mixed Hardwood Forest	1.05	0.01	None	0.01	0.23	0.01	0.09
Disturbed-Maintained	3.04	0.24	None	0.24	0.73	0.24	1.05
Total (acres)	<b>5.72</b>	0.25	None	0.25	1.12	0.25	1.18
<b>Total for ALT.</b>		<b>0.25</b>		<b>1.37</b>		<b>1.43</b>	
Perm. - Permanent Impacts Temp. - Temporary Impacts							

Impacts to wildlife resulting from the proposed project would be minimal due to the limited amount of habitat that would be impacted. Permanent impacts would be confined to the existing road shoulders and minimal fill in the adjacent wetlands.

**4.2 Wetland Communities**

Temporary impacts include those impacts that would result from demolition of the existing bridge and construction of the replacement bridge (Table 3). An offsite detour could be used during construction, thereby avoiding additional temporary wetland or stream impacts that would result from an onsite detour. Alternative 1 (off-site detour) would not result in temporary impacts to Waters of the United States. Alternative 2, the Preferred Alternative (temporary on-site detour to the east) would not result in temporary impacts to Waters of the United States. Alternative 3 (temporary on-site detour to the west) would impact approximately 0.03 acres of Waters of the United States. BMPs would be employed by the construction contractor to first avoid and then minimize impacts to Waters of the United States. Erosion and sedimentation would be controlled by implementation of a Sediment and Erosion Control Plan during construction. Any areas of Waters of the United States that are temporarily impacted would be restored to their original condition following completion of the disturbance activity.

Permanent impacts to Waters of the United States are those impacts that occur in areas within the construction limits where clearing would occur or areas would be permanently filled or excavated (Table 3). There are no permanent impacts associated with this project. Improvement to the bridge approaches would not result in placement of fill

material in wetlands adjacent to the existing road shoulders. The existing bridge is 68.5 feet long and on timber piles. The proposed replacement structure is a 90-foot long bridge.

**Table 3. Anticipated Impacts to Waters of the United States**

Jurisdictional Areas	ALT. 1		ALT. 2 (Preferred Alternative)		ALT. 3	
	Perm.	Temp.	Perm.	Temp.	Perm.	Temp.
Wetland A	None	None	None	None	None	None
Wetland B	None	None	None	None	None	None
Wetland C	None	None	None	None	None	None
Wetland D	None	None	None	None	None	None
Total (acres)	None	None	None	None	None	None
<b>Total Wetland Impacts (acres)</b>	<b>No Impact</b>		<b>No Impact</b>		<b>No Impact</b>	
Stream Impacts (acres)	None	None	None	None	None	0.03
Stream Impacts (linear feet)	None	None	None	None	None	120
<b>Total Stream Impacts (linear feet)</b>	<b>No Impact</b>		<b>No Impact</b>		<b>120</b>	
Perm. - Permanent Impacts						
Temp. - Temporary Impacts						

### 4.3 Aquatic Communities

There are no permanent impacts to water bodies as a result of the construction of this project. Therefore, impacts to aquatic communities would be minimal.

Temporary impacts to aquatic organisms could result from increased sedimentation during construction. Aquatic invertebrates would likely drift downstream during construction and recolonize the disturbed area once it has been stabilized. Sediments have the potential to affect fish and other aquatic life in several ways, including the clogging and abrading of gills and other respiratory surfaces, reducing the amount of available habitat due to the filling of wetlands, and altering water chemistry. Increased sedimentation may also cause decreased light penetration through an increase in turbidity. NCDOT's Best Management Practices (BMPs) for the protection of surface waters would be enforced to reduce impacts during demolition and construction phases.

**E. Special Topics**

**1.0 Waters of the United States**

**1.1 Wetlands**

Jurisdictional wetlands in the project study area are palustrine in nature, as defined in Cowardin et al. (1979). Palustrine systems include all non-tidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses and all wetlands where salinity due to ocean-derived salts is below 0.5% (Cowardin et al. 1979). Wetlands A, B, C, and D are dominated by broad-leaved deciduous vegetation, are seasonally flooded and saturated, giving them a Cowardin classification of PFO1E.

**1.2 Jurisdictional Streams**

Little Rockfish Creek is located within the study area, and flows in a well-defined channel. Little Rockfish Creek is a perennial stream, which by definition is classified as a Water of the United States. Based on a review of the USGS topographic maps, the soil survey, and GPS mapping; there are approximately 341 linear feet of stream within the project study area. Alternative 3 would temporarily impact approximately 120 linear feet of stream.

**2.0 Permits and Certifications**

The following federal and state permits and certifications would be required prior to beginning construction.

**2.1 Section 404**

In accordance with provisions of Section 404 of the CWA (33 United States Code [USC] 1344), a permit would be required from the USACE for the discharge of dredged or fill material into Waters of the United States. Because of the project is being documented as a Categorical Exclusion, it is expected that the project would qualify for a Nationwide Permit 23, which applies to approved Categorical Exclusions. In addition, a Nationwide Permit 33 which applies to temporary construction, access, and dewatering would be required if temporary construction is required that is not described in the Categorical Exclusion.

**2.2 Water Quality Certification**

Section 401 of the CWA requires that the state issue or deny a Water Quality Certification (WQC) for any federally permitted or licensed activity that may result in a discharge into Waters of the United States. Section 401 Certification allows surface waters to be temporarily impacted for the duration of the construction or other land manipulation. Issuance of a 401 Certification from the DWQ is a prerequisite to the

issuance of a Section 404 permit. If the general conditions of the corresponding WQC will be met, written concurrence from the DWQ is not required.

### **3.0 Mitigation**

Mitigation has been defined in NEPA regulations to include efforts which: a) avoid; b) minimize; c) rectify; d) reduce or eliminate; or e) compensate for adverse impacts to the environment (40 Code of Federal Regulations [CFR] 1508.20 [a-e]).

Federal Highway Administration policy stresses that all practicable measures should be taken to avoid or minimize impacts to wetlands which would be affected by federally-funded highway construction. A sequencing (step-down) procedure is recommended in the event that avoidance is impossible. Mitigation employed outside of the highway right-of-way must be reviewed and approved on a case-by-case basis.

**Avoidance** – Wetlands and Waters of the United States are present along both sides of the proposed project. Impacts can be avoided to streams and wetlands with the incorporation of an environmentally sensitive design. Impacts to jurisdictional surface waters can be avoided by bridging the stream channel, avoiding construction in the stream channel, and avoiding deposition of fill material in the stream channel during construction. Wetland impacts can be avoided by selecting an alignment, temporary detour, or an off-site detour to avoid impacts when possible.

**Minimization** – Impacts to the adjacent wetlands would be minimized by using 3:1 fill slopes through wetlands, and no lateral ditches would be constructed in wetlands. Selecting an alignment, temporary detour, or off-site detour that avoids wetlands to the greatest extent possible, can also be used to reduce wetland impacts. Stream impacts can be minimized by designing support structures that avoid open water habitats whenever possible. Utilization of BMPs would be required of the contractor to further minimize wetland impacts. The selection of Alternative 2 (temporary on-site detour) as the Preferred Alternative minimizes impacts to natural resources. Both Alternatives 1 and 2 do not have wetland impacts, but it was determined that an off-site detour (Alternative 1) would be detrimental to the operation of daily and school bus traffic over the bridge.

**Compensatory mitigation** – According to the conditions of the Nationwide Permit, the USACE would determine if the impacts are minimal and would at the same time determine if compensatory mitigation is required. Temporary impacts to Waters of the United States would be considered permanent by the USACE until areas are restored to their original condition. The restoration is subject to approval by the USACE. None of the alternatives would impact wetlands; therefore, wetland mitigation would not be required by the USACE. Alternatives 1 and 2 (Preferred) would not impact streams. Alternative 3 would impact approximately 120 linear feet of Little Rockfish Creek within the project area; therefore, stream mitigation may be required if this alternative was selected. Final mitigation decision rests with the USACE.

**F. Protected Species**

Rare and protected species listed for Cumberland County, and likely impacts to these species as a result of the proposed project are discussed in the following sections.

**1.0 Species Under Federal Protection**

Species with the federal classification of Endangered (E), Threatened (T), or officially proposed (P) for such listing, are protected under the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Eight federally protected species are listed for Cumberland County (USFWS database dated March 7, 2002, Cumberland County list updated March 14, 2006) (Table 4).

**Table 4. Federally Protected Species Listed for Cumberland County, NC**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Status*</b>	<b>Biological Conclusion</b>
<b>Vertebrates</b>			
Red-cockaded Woodpecker	<i>Picoides borealis</i>	E	No Effect
American Alligator	<i>Alligator mississippiensis</i>	T(S/A)	Not Applicable
<b>Invertebrates</b>			
Saint Francis' Satyr	<i>Neonympha mitchellii francisci</i>	E	No Effect
<b>Vascular Plants</b>			
Small Whorled Pogonia	<i>Isotria medeoloides</i>	T	No Effect
Pondberry	<i>Lindera melissifolia</i>	E	No Effect
Rough-leaved Loosestrife	<i>Lysimachia asperulaefolia</i>	E	No Effect
Michaux's Sumac	<i>Rhus michauxii</i>	E	No Effect
American Chaffseed	<i>Schwalbea americana</i>	E	No Effect

\*E - Endangered, T - Threatened, T(S/A) - Threatened due to similarity of appearance  
 Source: USFWS database dated March 7, 2002, updated March 14, 2006. Web Address: <http://nc-es.fws.gov/es/countyfr.html>

**Red-cockaded woodpecker (RCW) (*Picoides borealis*)**

The RCW is a cardinal-sized, seven to eight inch long, black and white woodpecker with a black cap on its head. It has a ladder pattern on the back and large white cheeks, which are unique among woodpeckers in its range (Audubon 2004). It is distinguished by two red streaks on each side of the black cap, which are referred to as cockades. There are normally only visible on adult males (NWF 2004).

Nesting habitat for the RCW is made up of large open pine stands (pine flatwoods and pine-dominated savannas) that are typically at least 80 years of age with little or no mid-story. This habitat is often maintained naturally by fires that occur as a result of lightning strikes. Foraging habitat is comprised of open pine or mixed pine/hardwood stands 30 years of age or older (Henry 1989). Nests are typically constructed 33 to 43 feet off of the ground in live pines that have been infected with red-heart disease. These nests can sometimes take several years to construct and are often reused. The RCW constructs resin wells below the opening to the nest to create a sticky coating on the bark of the tree; this coating protects the nest from predators such as rat snakes. The sticky coating has a shiny appearance, which allows the nest cavities to be easily seen from the ground. Red-cockaded woodpeckers forage in a wide variety of pine species and especially favor areas that contain large trees due to the large surface area of loose bark. They feed on adults, larvae, and eggs of arthropods, especially ants and termites that they find by flaking bark from the tree (Audubon 2004).

Based on a review of NCNHP records, there are no documented occurrences of the red-cockaded woodpecker within a three-mile radius of the project area.

**BIOLOGICAL CONCLUSION: No Effect**

According to the NCNHP element occurrence database records, there are no known occurrences of the red-cockaded woodpecker in the project vicinity. There are no mature pine-dominated stands that could be used for nesting or foraging habitat by the red-cockaded woodpecker. Also, no cavity trees were observed within a 0.5-mile radius of the study area. The proposed project would have No Effect on this federally endangered species.

***Analysis Details –***

**Methodology:** Analysis of the possible presence of and potential impacts to the red-cockaded woodpecker was conducted using an evaluation of existing information and an assessment of the habitat requirements. The NCNHP element occurrence database was consulted on March 29, 2004.

**American Alligator (*Alligator mississippiensis*)**

The American alligator is listed as Threatened Due to Its Similarity in Appearance to other protected crocodylians. However, no other crocodylians occur within the state of North Carolina. Adult males typically reach 13 to 15 feet in length, and females reach lengths of just under 10 feet (FLMNH 2002).

American alligators can be found in a variety of estuarine aquatic habitats including swamp forests, marshes, large streams, canals, ponds, and lakes (Martof *et al.* 1980). Juveniles prey upon a wide variety of small invertebrates, particularly insects, and small fish and frogs. As they grow larger, their dietary range increases to include consequently larger prey. Eventually, large adults can overcome nearly all aquatic and terrestrial prey that comes within range, but their diet primarily consists of fish, turtles, relatively small mammals, birds, and reptiles, including small alligators (FLMNH 2002).

NCNHP records document one occurrence of an American alligator within a three-mile radius of the project study area. An American alligator occurred approximately three miles south of the project study area. This record is listed as historic by the NCNHP, which means that it occurred over 20 years ago.

**BIOLOGICAL CONCLUSION: Not Applicable**

***Analysis Details –***

**Methodology:** Analysis of the possible presence of and potential impacts to the American alligator was conducted using an evaluation of existing information and an assessment of the habitat requirements. The NCNHP element occurrence database was consulted on March 29, 2004.

**Saint Francis' Satyr (*Neonympha mitchellii francisci*)**

The Saint Francis' satyr is a fairly small, dark brown butterfly with a wingspan ranging from 1.5 to 2.0 inches. It is one of the rarest butterfly species in eastern North America and is known to only one population in North Carolina. Saint Francis' satyr has "eyespot" on the lower surface of its wings, which are dark maroon-brown in the center and reflect a silver cast in certain light. The border of the eyespot is straw yellow, with the outermost border being dark brown. The spots are usually round to slightly oval and are well developed on the forewing as well as on the hind wing, accented by two bright orange bands along the posterior wing edges and two darker brown bands across the central portion of each wing (FWS 2003e).

The habitat of the satyr consists of wide, wet meadows dominated by sedges and other wetland graminoids, with the meadows being the result abandoned of beaver impoundments. The larval host plants are believed to be graminoids such as grasses, sedges, and rushes (FWS 2003e). This butterfly occurs in several natural plant communities including coastal plain semi-permanent impoundment-bog variant, coastal plain small stream swamp-canebrake variant, sandhills seep-bog variant, and stream head pocosin-canebrake variant (US Army 2003d). Saint Francis' satyr has also been observed in pitcher plant (*Sarracenia flava*) swales, with cane, and with rare plants rough-leaved loosestrife and pocosin lily. It is, however, unknown whether the satyr uses such habitat for reproduction or simply as a dispersal corridor (FWS 2003e).

Based on a review of NCNHP records, there are no documented occurrences of Saint Francis' satyr within a three-mile radius of the project study area.

**BIOLOGICAL CONCLUSION: No Effect**

According to the NCNHP element occurrence database records, there are no known occurrences of Saint Francis' satyr in the project vicinity. The wide, wet meadows resulting from abandoned beaver impoundments necessary to support Saint Francis' satyr are not present within the project study area. The proposed project would have No Effect on this federally endangered species.

***Analysis Details –***

**Methodology:** Analysis of the possible presence of and potential impacts to Saint Francis' satyr was conducted using an evaluation of existing information and an assessment of the habitat requirements. Additionally, the NCNHP element occurrence database was consulted on March 29, 2004.

**Small Whorled Pogonia (*Isotria medeoloides*)**

The small whorled pogonia is a terrestrial plant, 4 to 10 inches in height and has 5 to 6 leaf whorl at the apex of the stem. The flower is a solitary yellowish-green flower (occasionally two) found on top of the stem, with a three lobed lip veined with green (Orchid 1997). The leaves are grayish green and usually 1.5 to 3.0 inches in length (NatureServe 2003a). The flower would bloom between May and June, and can be dormant without flowering for several years (Orchid 1997).

The habitat is dry deciduous woodlands, and except for in Florida the small whorled pogonia is considered the rarest orchid in the eastern United States (Orchid 1997). The small whorled pogonia prefers acidic fragipan soils on slopes ranging from dry-mesic to wet-mesic where lateral water drainage is pronounced (NatureServe 2003a). This species is generally known from open, dry, deciduous woods with acid soil. Small whorled pogonia occurs in habitat where there is relatively high shrub coverage or high sapling density (FWS 1996).

Based on a review of NCNHP records, there are no documented occurrences of small whorled pogonia within a three-mile radius of the project study area.

**BIOLOGICAL CONCLUSION: No Effect**

According to the NCNHP element occurrence database records, there are no known occurrences of small whorled pogonia in the project vicinity. The upland forests within the project study area have a dense herbaceous layer, which would not support the small whorled pogonia. The proposed project would have No Effect on this federally threatened species.

***Analysis Details –***

**Methodology:** Analysis of the possible presence of and potential impacts to the small whorled pogonia was conducted using an evaluation of existing information and an assessment of the habitat requirements. The NCNHP element occurrence database was consulted on March 29, 2004.

**Pondberry (*Lindera melissifolia*)**

Pondberry is a stoloniferous, deciduous, aromatic shrub that can grow up to 13 feet tall. Pondberry usually occurs in clones of numerous stems with erect or ascending shoots and few branches. The alternate drooping leaves are subcordate with prominent venation and pubescence on the lower surface (USDA 2004). The leaves smell like lemony-sassafras when crushed. Small pale yellow flowers bloom in early spring before the leaves have developed, and the bright red fruits often persist on the plants after the leaves have died in the fall (NatureServe 2003b).

The species occurs in lowland habitats with hydric soils, in areas that are usually flooded in winter (USDA 2004). These lowland habitats would include seasonally flooded wetlands, such as bottomland hardwood forests and forested swales and (in coastal areas of the Carolinas) along the margins of sinks, ponds and depressions in pinelands (NatureServe 2003b). Pondberry grows in shaded areas, but has been known to grow in full sun (FWS 2003c).

Based on a review of NCNHP records, there are no documented occurrences of pondberry within a three-mile radius of the project study area.

**BIOLOGICAL CONCLUSION: No Effect**

According to the NCNHP element occurrence database records, there are no known occurrences of pondberry in the project vicinity. The wetland habitat (bottomland hardwood forests, forested swales, margins of sinks or ponds, and depressions in pinelands) necessary to support pondberry was not observed within the project study area. The proposed project would have No Effect on this federally endangered species.

***Analysis Details –***

***Methodology:*** Analysis of the possible presence of and potential impacts to pondberry was conducted using an evaluation of existing information and an assessment of the habitat requirements. The NCNHP element occurrence database was consulted on March 29, 2004.

**Rough-leaved Loosestrife (*Lysimachia asperulaefolia*)**

Rough-leaved loosestrife is an erect, rhizomatous, perennial herb that grows to one to two feet in height. It has whorls of three to four leaves that encircle its stem at intervals below a yellow inflorescence. Blooming occurs from mid-May through June. Fruiting occurs from July to October (FWS 2003d).

Rough-leaved loosestrife generally occurs on acidic, moist to seasonally saturated sands and on acidic, shallow, organic soils overlaying sand. It also grows on shallow, poorly drained, deep peat soils of low pocosins and Carolina bays (US Army 2003c). Rough-leaved loosestrife occurs most often along the ecotone between longleaf pine uplands and pond pine pocosins (areas of areas of dense shrub and vine growth usually on a wet, peaty, poorly drained soil) (FWS 2003d). Rough-leaved loosestrife has also been found in ecotones between pocosins and longleaf pine savanna, longleaf pine flatwoods, sandhills seeps, and pond and lake margins (US Army 2003c).

Based on a review of NCNHP records, there are no documented occurrences of rough-leaved loosestrife within a three-mile radius of the project area.

**BIOLOGICAL CONCLUSION: No Effect**

According to the NCNHP element occurrence database records, there are no known occurrences of rough-leaved loosestrife in the project vicinity. There are

no Carolina bays or pocosins that could support rough-leaved loosestrife within the project study area. The proposed project would have No Effect on this federally endangered species.

***Analysis Details –***

Methodology: Analysis of the possible presence of and potential impacts to rough-leaved loosestrife was conducted using an evaluation of existing information and an assessment of the habitat requirements. The NCNHP element occurrence database was consulted on March 29, 2004.

**Michaux's Sumac (*Rhus michauxii*)**

Michaux's sumac is a low-growing, densely soft-hairy, dioecious shrub with erect stems one to three feet tall. The shrub has compound leaves that are narrowly winged at their base, dull above, and veiny and slightly hairy beneath, with fine teeth on the edges of the leaflets (FWS 2003c). Michaux's sumac produces erect clusters of greenish-yellow to white flowers in June, followed (in the female plants) by conspicuous red fruits that persist from August through September or October (NatureServe 2003c).

Michaux's sumac typically grows in sandy or rocky open woods on basic soils (FWS 2003c). The plants growing in natural habitats are found in pine/scrub oak sandhill (loamy soil variant and blackjack-mixed oak variant) communities. Other sites include small wildlife food plots, forest clear cuts, abandoned building sites, and sparse to moderately dense pine or pine/hardwood canopies. The species is shade-intolerant and is therefore dependent on some type of disturbance to maintain the open condition of its habitat. Historically, this disturbance was in the form of naturally occurring fires, or possibly localized grazing by native wildlife (US Army 2003b). Michaux's sumac will also grow in areas such as highway rights-of-way, roadsides, or on the edges of artificially maintained clearings (FWS 2003c).

Based on a review of NCNHP records, there are no documented occurrences of Michaux's sumac within a three-mile radius of the project area.

**BIOLOGICAL CONCLUSION: No Effect**

According to the NCNHP element occurrence database records, there are no known occurrences of Michaux's sumac in the project vicinity and while suitable habitat (disturbed power-line right-of-way) was observed within the project study area no specimens were found during field surveys. A meandering pedestrian transect survey (with transects providing 100% visual coverage of suitable habitat) was completed for areas that appeared to be potential habitat, during the bloom period on June 10, 2004. A known location was examined by LPA biologists off of US 15-501 in Scotland County, NC on May 25, 2004. The proposed project would have No Effect on this federally endangered species.

***Analysis Details –***

Methodology: Analysis of the possible presence of and potential impacts to Michaux's sumac was conducted using an evaluation of existing information and

an assessment of the habitat requirements. The NCNHP element occurrence database was consulted on March 29, 2004.

**American Chaffseed (*Schwalbea americana*)**

American chaffseed is a perennial herb with mostly unbranched stems, usually one to two feet tall. Leaves are largest at the base of the plant and gradually diminish in size towards the top of the stem. The two-lipped tubular flowers are yellow, suffused with purple. American chaffseed blooms from April through June in the South and from June to late July in the North (NatureServe 2003c). The leaves are alternate, lance shaped to elliptic, stalkless, and are one to two inches in length. The fruits are long and narrow and enclosed in a sac like structure, fruits mature from early summer in the south, to October in the north (FWS 2003a). This species is parasitic on the roots of a wide variety of woody and herbaceous plants (NatureServe 2003c).

American chaffseed typically grows in sandy (sandy peat, sandy loam), acidic, and seasonally moist to dry soils. It is generally found in habitats described as open, moist pine flatwoods, pine/wiregrass savannas, and ecotonal areas between peaty wetlands and xeric sandy soils (US Army 2003a). All of these habitats were historically maintained by human or lightning-caused wildfires. American chaffseed is dependent on factors such as fire, mowing, or fluctuating water tables to maintain the crucial, open to partly-open conditions that it requires (FWS 2003a). These habitats are species-rich, with grasses, sedges, and savanna dicots being especially numerous (US Army 2003a). Natural communities that could include American chaffseed are; open pine flatwoods, pitch pine lowland forests, seepage bogs, palustrine pine savannahs, and other grass and sedge-dominated plant communities (NatureServe 2003c).

Based on a review of NCNHP records, there are no documented occurrences of American chaffseed within a three-mile radius of the project study area.

**BIOLOGICAL CONCLUSION: No Effect**

According to the NCNHP element occurrence database records, there are no known occurrences of American chaffseed in the project vicinity. There are no open, moist pine flatwoods, pine/wiregrass savannas, or ecotonal areas between peaty wetlands and xeric sandy soils that could support American chaffseed present within the project study area. The proposed project would have No Effect on this federally endangered species.

***Analysis Details –***

Methodology: Analysis of the possible presence of and potential impacts to the American chaffseed was conducted using an evaluation of existing information and an assessment of the habitat requirements. The NCNHP element occurrence database was consulted on March 29, 2004.

## **2.0 Federal Species of Concern**

The March 7, 2002, FWS list for Cumberland County (updated March 14, 2006) also includes a category of species designated as “Federal Species of Concern” (FSC). The FSC designation provides no federal protection under the ESA for the species listed. The presence of potential suitable habitat within the project study area has been evaluated for the following FSC species listed for Cumberland County are shown in Table 5.

NCNHP records were reviewed to determine the known locations of FSC within the project vicinity. NCNHP records do not document any occurrences of FSC within a three-mile radius of the project study area.

**Table 5: Federal Species of Concern (FSC) Listed for Cumberland County, NC**

Common Name	Scientific Name	State Status*	Potential Habitat
<b>Vertebrates</b>			
Bachman's sparrow	<i>Aimophila aestivalis</i>	SC	Yes
Black-throated green warbler	<i>Dendroica virens waynei</i>	SR	Yes
Carolina gopher frog	<i>Rana capito capito</i>	#	No
Southern hognose snake	<i>Heterodon simus</i>	SC~ ^	Yes
Northern pinesnake	<i>Pituophis melanoleucus</i>	SC^	Yes
Broadtail madtom	<i>Noturus sp.</i>	SC^	Yes
American eel	<i>Anguilla rostrata</i>	#	Yes
Sandhills chub	<i>Semotilus lumbee</i>	SC	Yes
<b>Invertebrates</b>			
Atlantic pigtoe	<i>Fusconaia masoni</i>	E	No
Yellow lampmussel	<i>Lampsilis cariosa</i>	E	No
Hessel's hairstreak	<i>Callophrys hesseli</i>	#	Yes
<b>Non-Vascular Plants</b>			
Savanna campylopus	<i>Campylopus carolinae</i>	SR-T	Yes
<b>Vascular Plants</b>			
Georgia indigo bush	<i>Amorpha Georgiana var georgiana</i>	E	No
Sandhills milk-vetch	<i>Astragalus michauxii</i>	T	No
Cuthbert turtlehead	<i>Chelone cuthbertii</i>	SR-L	No
Bog oatgrass	<i>Danthonia epilis</i>	SR-T	Yes
Venus flytrap	<i>Dionaea muscipula</i>	SR-L, SC	No
White wicky	<i>Kalmia cuneata</i>	#	No
Sandhills bog lily	<i>Lilium iridollae</i>	#	No
Bog spicebush	<i>Lindera subcoriacea</i>	T	No
Pondspice	<i>Litsea aestivalis</i>	SR-T	No
Boykin's lobelia	<i>Lobelia boykinii</i>	T	No
Long beach seedbox	<i>Ludwigia brevipes</i>	SR-T	No
Loose watermilfoil	<i>Myriophyllum laxum</i>	T	No
Savanna cowbane	<i>Oxypolis ternata</i>	#	No
Carolina grass of Parnassus	<i>Parnassia caroliniana</i>	E	No
Conferva pondweed	<i>Potamogeton confervoides</i>	SR-D	No
Spiked medusa	<i>Pteroglossaspis ecristata</i>	E~	Yes
Awed meadow-beauty	<i>Rhexia aristosa</i>	T~	No
Carolina goldenrod	<i>Solidago pulchra</i>	E	No
Spring-flowering Goldenrod	<i>Solidago verna</i>	SR-L	No
Pickering's daffodil	<i>Stylisma pickeringii var pickeringii</i>	E	Yes
Carolina asphodel	<i>Tofieldia glabra</i>	#	No
Roughleaf yellow-eyed-grass	<i>Xyris scabrifolia</i>	SR-T	No
Sandhills pyxie-moss	<i>Pyxidantha barbulate var. brevistyla</i>	E	No

E - Endangered, T - Threatened, SR - Significantly Rare, SC - Special Concern, SR-T - Rare throughout its range, SR-L - Range is limited to NC and adjacent states, SR-P - Periphery of its range in NC, \* - No longer tracked by NCNHP, \*\* - Occurs on NCNHP list but not on USFWS list, # - Not listed as a FSC on NCNHP list, ^ - Obscure record, ~ - Historic record (last observed over 50 years ago)

**VI. CULTURAL RESOURCES**

**A. Compliance Guidelines**

This project is subject to compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, implemented by the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106, codified at 36 CFR Part 800. Section 106 requires that for federally funded, licensed, or permitted projects having effects on properties listed in or eligible for the National Register of Historic Places, the Advisory Council on Historic Preservation be given the opportunity to comment.

**B. Historic Architecture**

In a memorandum July 7, 2004 the State Historic Preservation Office concurred that the proposed project would not have an effect on any historic resources. A copy of the memorandum is included in the Appendix.

**C. Archaeology**

The State Historic Preservation Office has requested an archaeological survey. The survey would identify and evaluate the significance of archaeological remains that may be impacted by the proposed project. Potential effects on unknown resources must be assessed prior to the initiation of construction activities.

**VII. SECTION 4(f) RESOURCES**

Section 4(f) of the Department of Transportation Act of 1966, as amended, states in part "The Secretary may approve a transportation project or program requiring the use of publicly owned land of a park, recreation area, or wildlife and waterfowl refuge, or land of a historic site of national, state, or local significance (as determined by the Federal, State, or local officials having jurisdiction over the park, recreation area, refuge, or site) only if-

- (1) there is no prudent or feasible alternative to using that land; and
- (2) the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from such use."

No publicly owned parks or recreational facilities, wildlife and waterfowl refuges, or historic sites of national, state, or local significance would be impacted as a result of proposed project. The proposed project would not require right-of-way acquisition or easement from any land protected under Section 4(f) of the Department of Transportation Act of 1966.

## **VIII. ENVIRONMENTAL EFFECTS**

The project is expected to have a positive effect on transportation and the surrounding community. The replacement of the inadequate bridge would result in safer and more efficient traffic operations.

This project is considered a Federal "Categorical Exclusion" due to its limited scope and lack of substantial consequences.

Replacement of Bridge No. 80 would not have a negative effect on the quality of the human or the natural environment.

This project is not in conflict with any plan, existing land use, or zoning regulation. No change in current land use is expected to result from the project.

No adverse impact on families or the community is expected. Right-of-way acquisition would be limited. No relocations are expected with the implementation of the proposed alternative.

In compliance with Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations) a review was conducted to determine the whether minority or low income populations would receive disproportionately high and adverse human health and environmental impacts as a result of this project. The investigation determined the project would not disproportionately impact any minority or low-income populations.

No adverse effect on public facilities or services is expected. The project is not expected to adversely affect social, economic, or religious opportunities in the area. There would be some temporary inconvenience to local travel due to construction activities on SR 1180.

The studied route does not contain any bicycle accommodations, nor is it a designated bicycle route; therefore, no bicycle accommodations have been included as part of this project.

This project has been coordinated with the United States Department of Agriculture, Natural Resources Conservation Service (NRCS). The Farmland Protection Policy Act requires all federal agencies or their representatives to consider the potential impact to prime farmland for all land acquisition and construction projects. Soils were identified within a 0.5-mile radius of the project area, and checked to see if they were classified as prime, unique, or have state or local importance. Six of the soils were on the NRCS list, *Important Farmlands of North Carolina, May 1998*. Soils in which all areas are considered prime farmland included Gilead Loamy Sand, 2 to 8 percent slopes (GdB). Soils in which all areas are considered farmland of statewide importance included Blaney Loamy Sand, 8 to 15 percent slopes (BaD), Wagram Loamy Sand, 0 to 6 percent slopes

(WaB), Blaney Loamy Sand, 2 to 8 percent slopes (BaB), and Autryville Loamy Sand, 0 to 2 percent slopes (AuA). Soils in which only drained areas are considered unique farmland included Torhunta and Lynn Haven Soils (TR). If impacts to these soils occur as a result of the proposed project, they are expected to be limited in nature.

Cumberland County was designated as a marginal nonattainment for O<sub>3</sub> under the eight-hour ozone standard on April 15, 2004. Cumberland County is under an Early Action Compact and the effective date of the nonattainment designation has been deferred until December 31, 2006, 40 CFR Parts 51 and 93 is not applicable until December 31, 2007 (one year after the nonattainment designation becomes effective).

In accordance with 40 CFR 93.126, this project is an air quality neutral project. It is not required to be included in the regional emissions analysis (if applicable) and a project level CO analysis is not required.

The purpose of this project is to replace Bridge No. 80 on SR 1180 over Little Rockfish Creek. The bridge is an inadequate structure and replacing the bridge will result in safer and more efficient traffic operations. This project will not result in any meaningful changes in traffic volumes, vehicle mix, location or the existing facility, or any other factor that would cause an increase in emissions impacts relative to the no-build alternative. As such, FHWA has determined that this project will generate minimal air quality impacts for Clean Air Act criteria pollutants and has not been linked with any special MSAT concerns. Consequently, this effort is exempt from analysis for MSATs.

Moreover, EPA regulations for vehicle engines and fuels will cause overall MSATs to decline significantly over the next 20 years. Even after accounting for a 64 percent increase in VMT, FHWA predicts MSATs will decline in the range of 57 percent to 87 percent, from 2000 to 2020, based on regulations now in effect, even with a projected 64 percent increase in VMT. This will both reduce the background level of MSATs as well as the possibility of even minor MSAT emissions from this project.

If vegetation or wood debris is disposed of by open burning, it shall be done in accordance with applicable local laws and regulations of the North Carolina Implementation Plan (SIP) for air quality in compliance with 15 NCAC 2D.0520 and the 1990 Clean Air Act Amendments and the National Environmental Policy Act. This evaluation completes the assessments for air quality, and no additional reports are required.

Ambient noise levels may increase during the construction of this project; however this increase would be only temporary and usually confined to daylight hours. There should be no notable change in traffic volumes after the project is complete. Therefore, this project would have no adverse effect on existing noise levels. Noise receptors in the project area would not be impacted by this project. This evaluation completes the assessment requirements for highway noise set forth in 23 CFR Part 722. No additional reports are required.

A “Geo-Environmental Impact Evaluation” was conducted by the NCDOT at the project site to identify any properties that may contain hazardous waste materials and result in future environmental liability if acquired. These hazards include, underground storage tanks (USTs), hazardous waste sites, regulated landfills, unregulated dumpsites, and any other site or materials that are considered hazardous. A field reconnaissance survey, a file search of appropriate environmental agencies, and a Geographical Information System (GIS) were used to identify any known problem sites along the proposed project alignment. The field reconnaissance survey yielded no anticipated UST sites within the project area. A GIS analysis of the project corridor showed no regulated landfills, or unregulated dumpsites were within the project limits. GIS analysis and field reconnaissance found no potential RCRA or CERCLA sites within the project limits. Based on field reconnaissance and a records search there should be no contamination issues for the B-4092 project.

Cumberland County is a participant in the Federal Flood Insurance Program. The bridge is located within a Detailed Study Area. The new structure should be designed to match or lower the existing 100-year storm elevation upstream of the roadway. Since the proposed replacement for Bridge No. 80 would be a structure similar in waterway opening size, it is not anticipated that it would have any significant adverse impact on the existing floodplain, and it would not raise floodplain levels. The Federal Emergency Management Agency, Flood Insurance Rate Map (FIRM) for the project study area is attached.

Based on the above discussion, it is concluded that no substantial environmental impacts would result from the replacement of Bridge No. 80.

## **IX. PUBLIC INVOLVEMENT**

A Citizens Informational Workshop was held on December 5, 2005 at Jack Britt High School in Fayetteville. Citizens were given the opportunity to view the project alternatives and make comments concerning the project. Local residents agreed that Alternative 2 (the Preferred Alternative) was the best alternative for the local community.

Newsletters describing the project and announcing the Citizens Informational Workshop were sent to local residents. The newsletters also gave citizens an opportunity to comment by phone, mail, or e-mail. A copy of the newsletter is included in the Appendix. Comments received indicated further that local residents would prefer Alternative 2 (the Preferred Alternative).

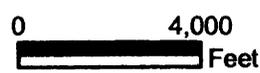
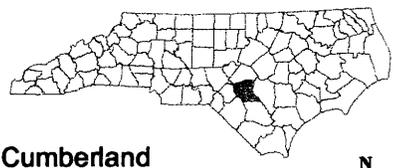
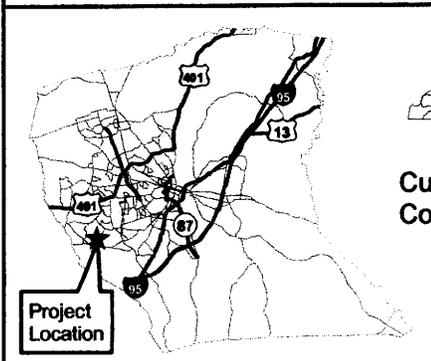
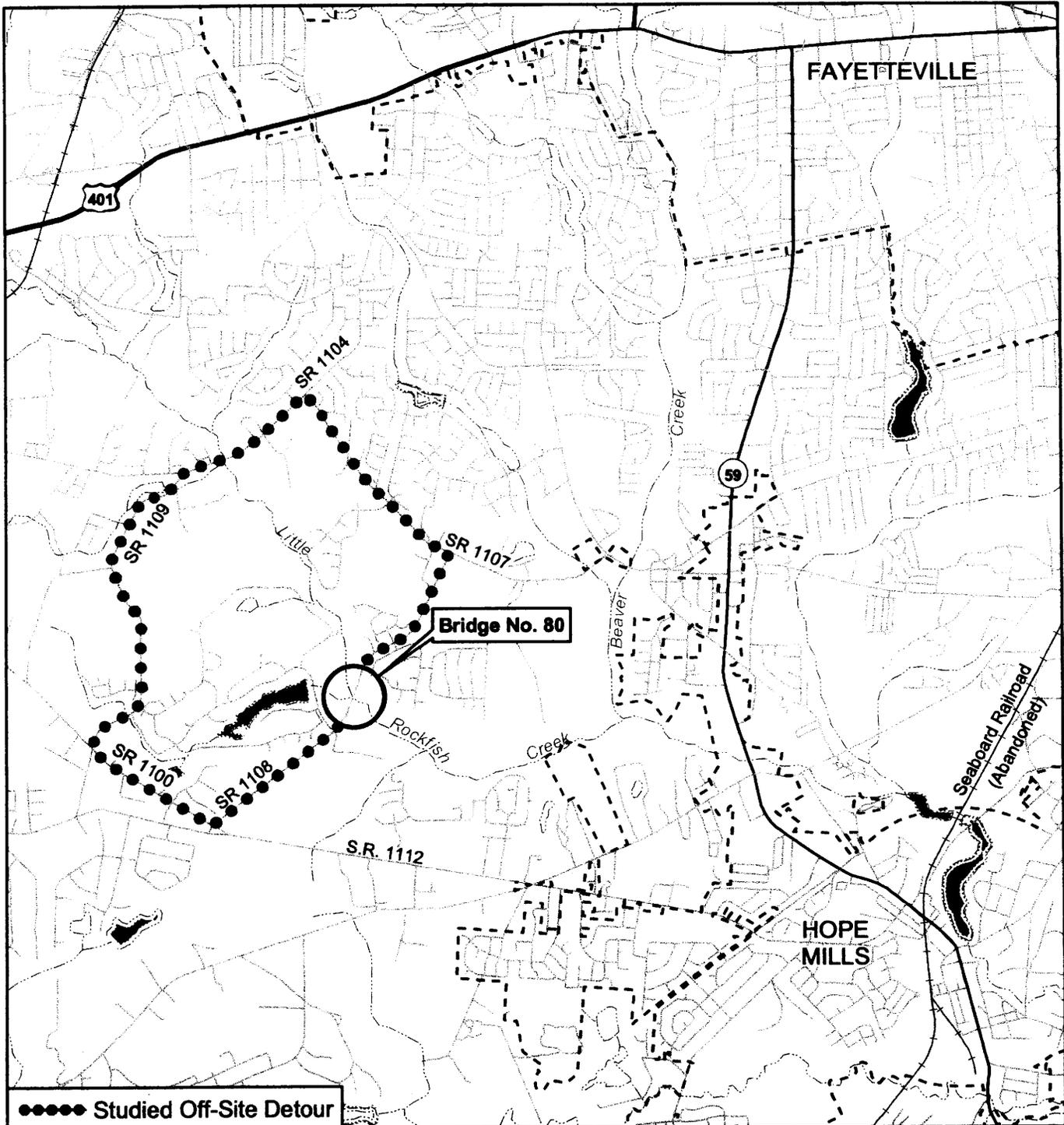
## **X. AGENCY COMMENTS**

Comments on the proposed project were requested from federal, state and local agencies. Several agencies have commented upon the proposed bridge alignment. These comments

have been considered during the environmental and design process and are included in the Appendix.

The North Carolina Wildlife Resources Commission (NCWRC) had requested an in-water work moratorium for sunfish from April 1 to June 30. However, any species of sunfish that would occur in the study area would not be a federally protected species and would not receive protection under the ESA. If this moratorium was observed, it is unlikely that the bridge could be replaced during one construction season. This would result in additional costs and disruption to travel on this heavily used route. Therefore, the moratorium is not proposed; however, the standard BMPs will still apply.

## **FIGURES**



North Carolina Department of Transportation  
Project Development and  
Environmental Analysis Branch

**Cumberland County  
Replace Bridge No. 80 on SR 1108  
Over Little Rockfish Creek  
B-4092**

**PROJECT VICINITY MAP**

**Figure 1**

ALTERNATIVE 1  
Replace with Bridge  
Off-Site Detour  
ALTERNATIVE 2 and 3  
Replace with Bridge

ALTERNATIVE 3  
Temporary On-Site Detour

ALTERNATIVE 2  
(Preferred Alternative)  
Temporary On-Site Detour

BRIDGE NO. 80

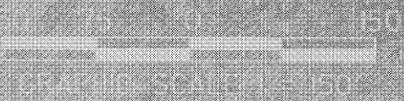


North Carolina Department of Transportation  
Project Development and  
Environmental Analysis Branch

Cumberland County  
Replace Bridge No. 80 on S.R. 1108  
Over Little Rockfish Creek  
B-4082

SCALE: 1" = 150'

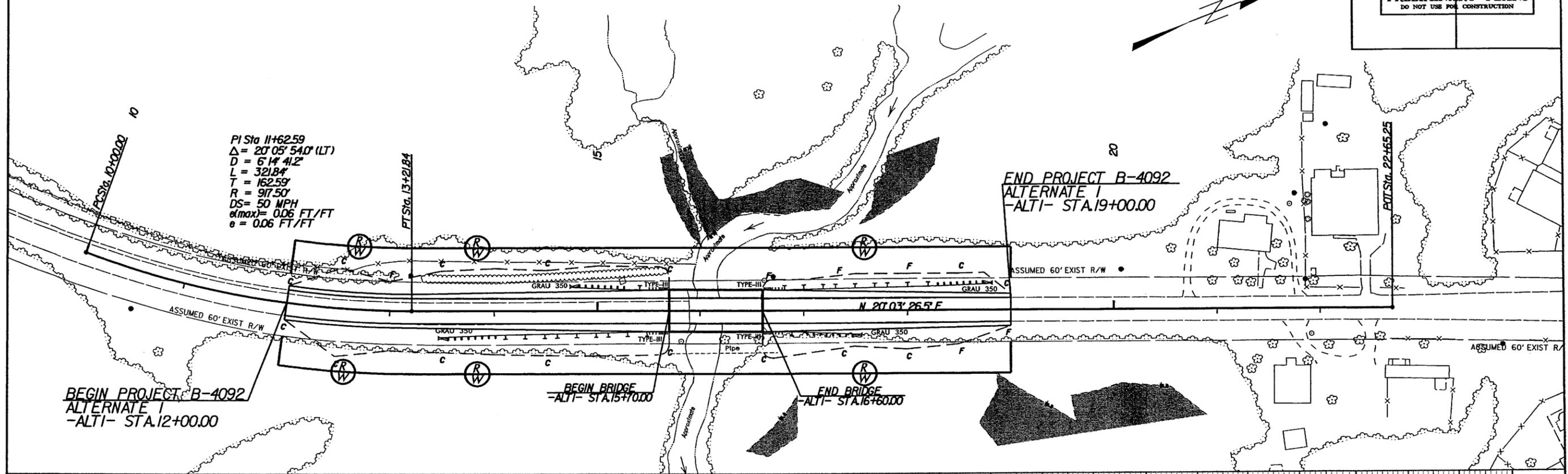
Figure 2A



# B4092 (ALTERNATE 1)

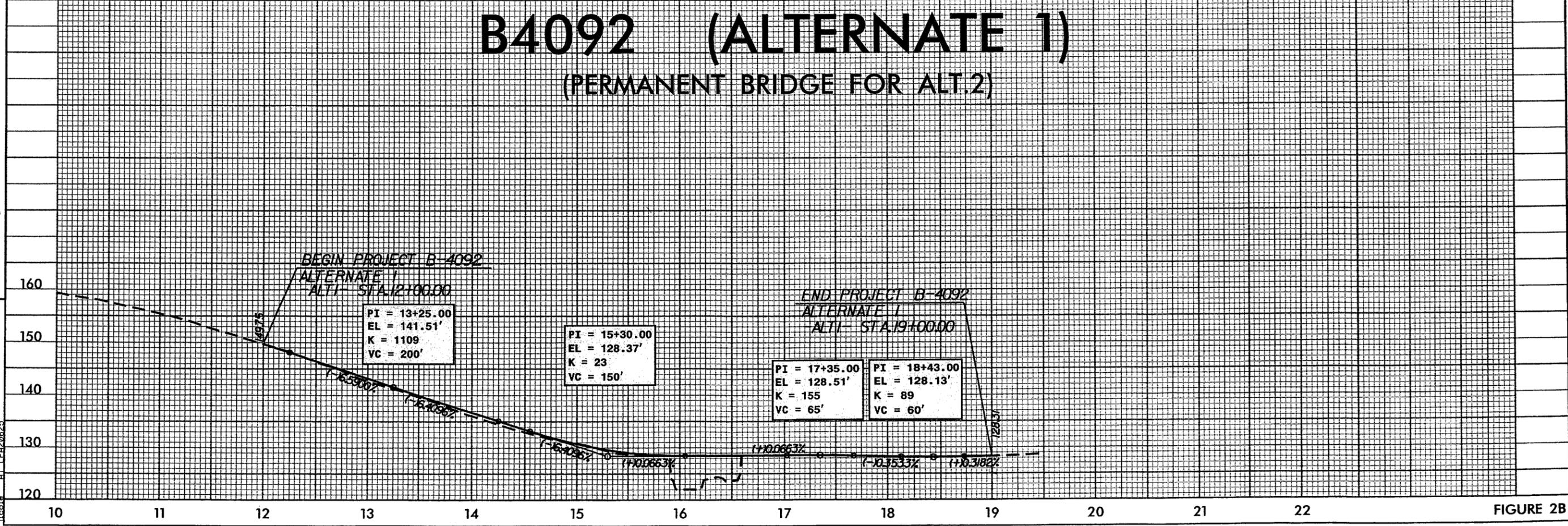
PROJECT REFERENCE NO. B-4092	SHEET NO. 1
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR A/CQUISITION <b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	

8/17/99



# B4092 (ALTERNATE 1)

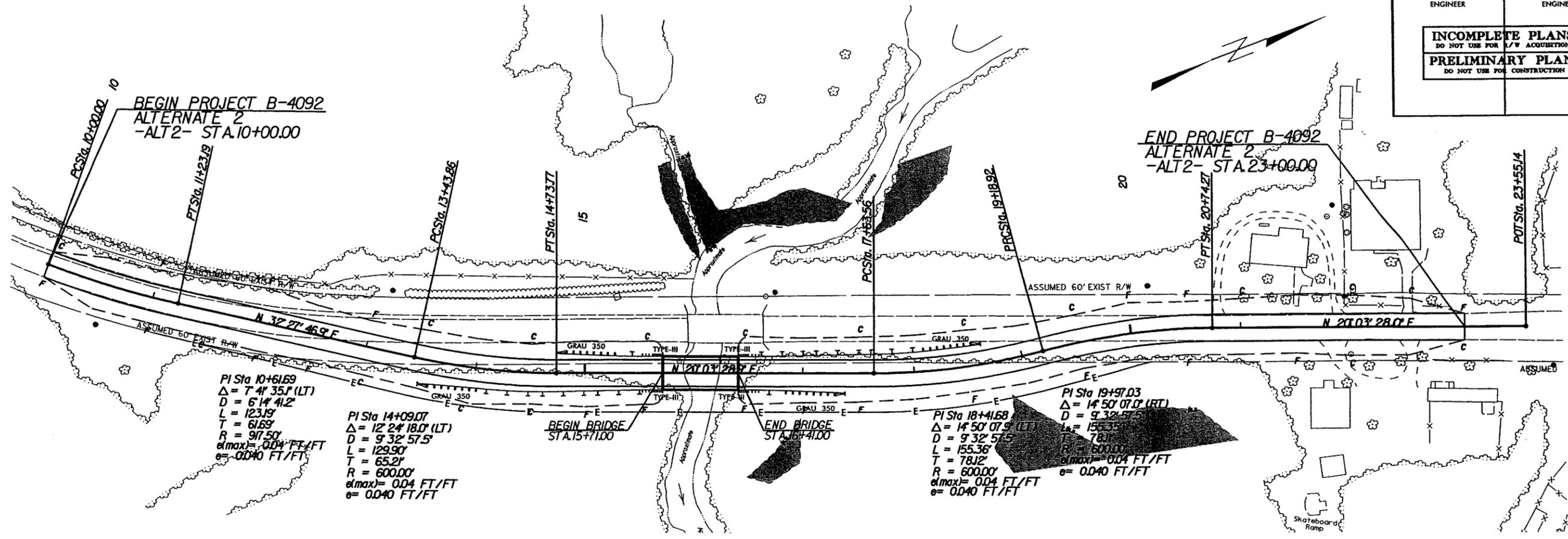
## (PERMANENT BRIDGE FOR ALT.2)



REVISIONS

27-MAR-2006 13:38  
 C:\Projects\Bridges\B4092\proj\B4092.alt1.psh.dgn  
 Project: B4092  
 Job: A

FIGURE 2B



# B4092 (ALTERNATE 2)

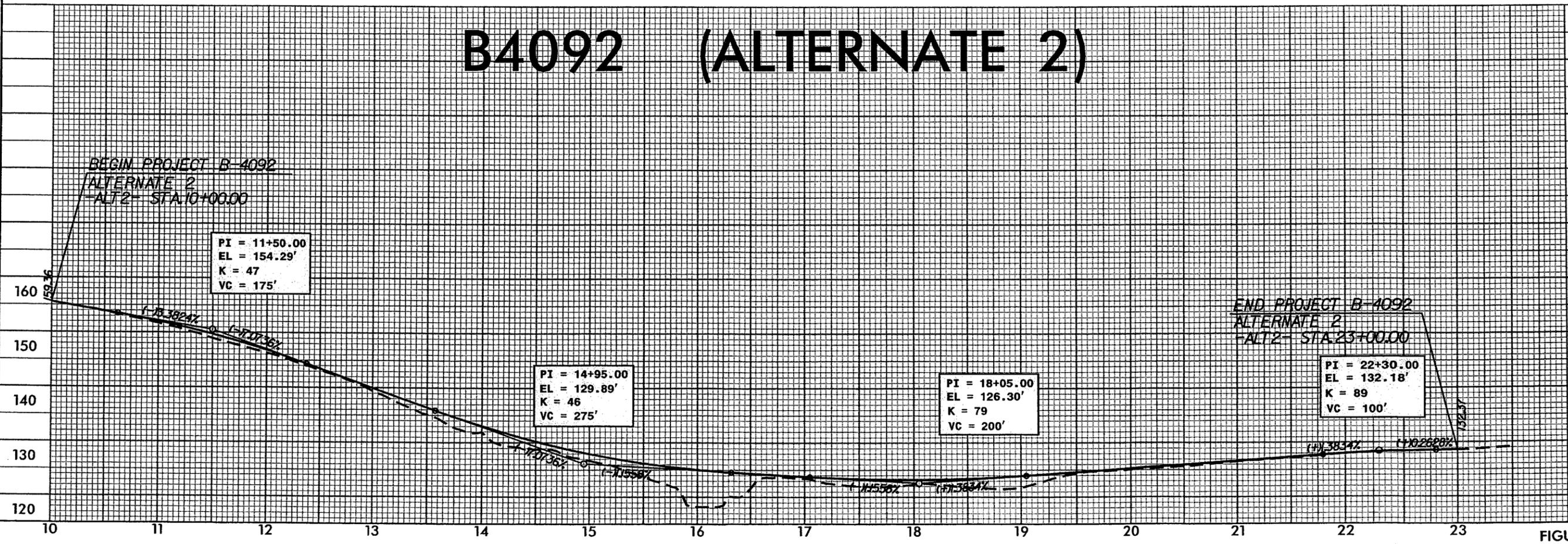
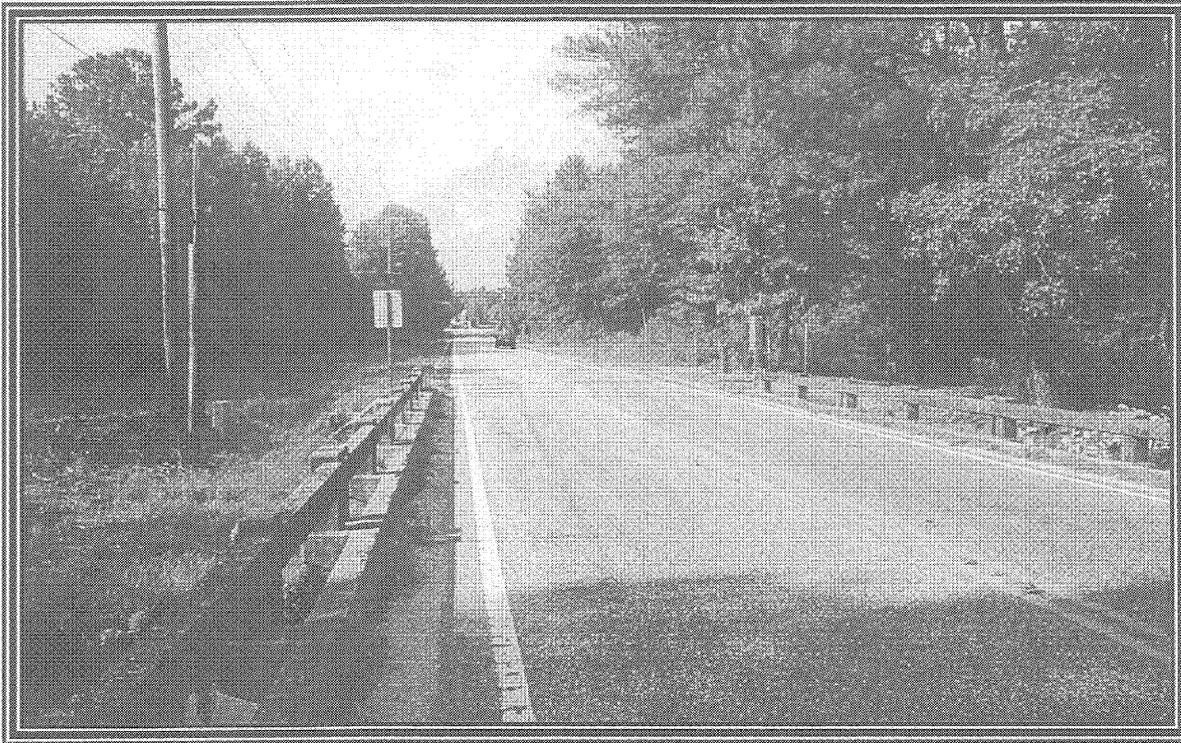


FIGURE 2C

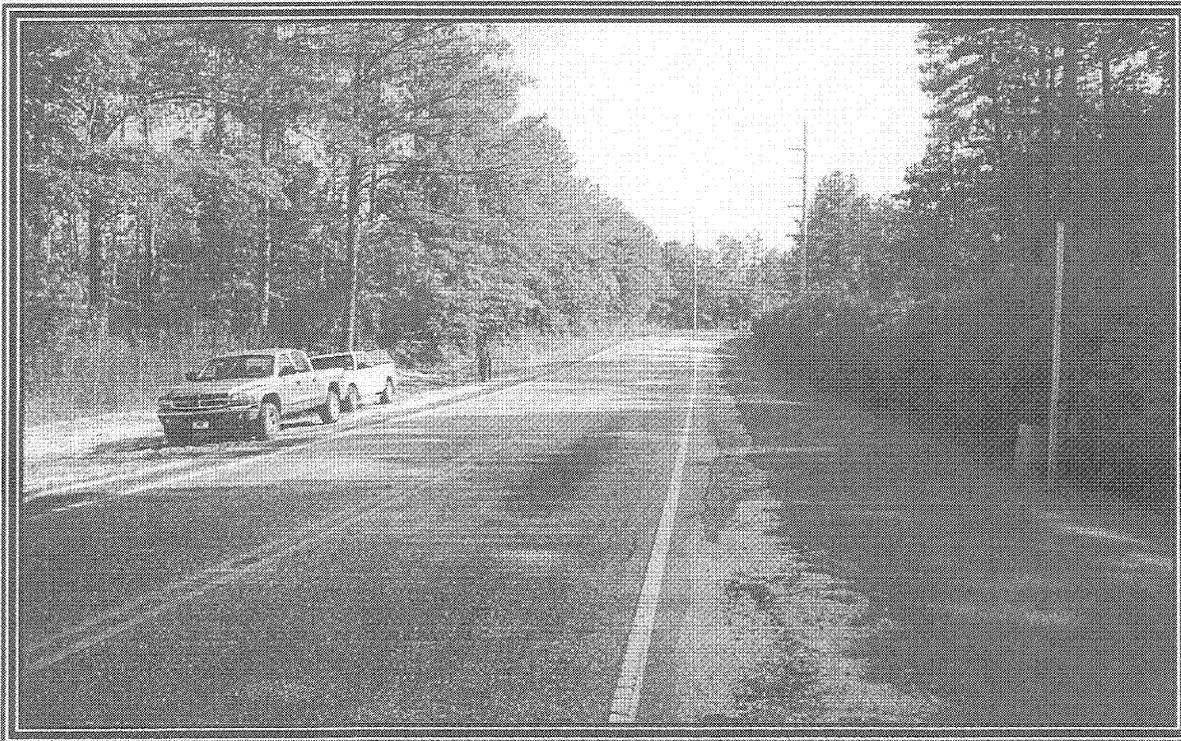
8/17/99  
 REVISIONS  
 07/MAR/2006 13:38  
 C:\Users\jw\Documents\Bridges Group\46\B4092\proj\B4092.alt2.psh.dgn



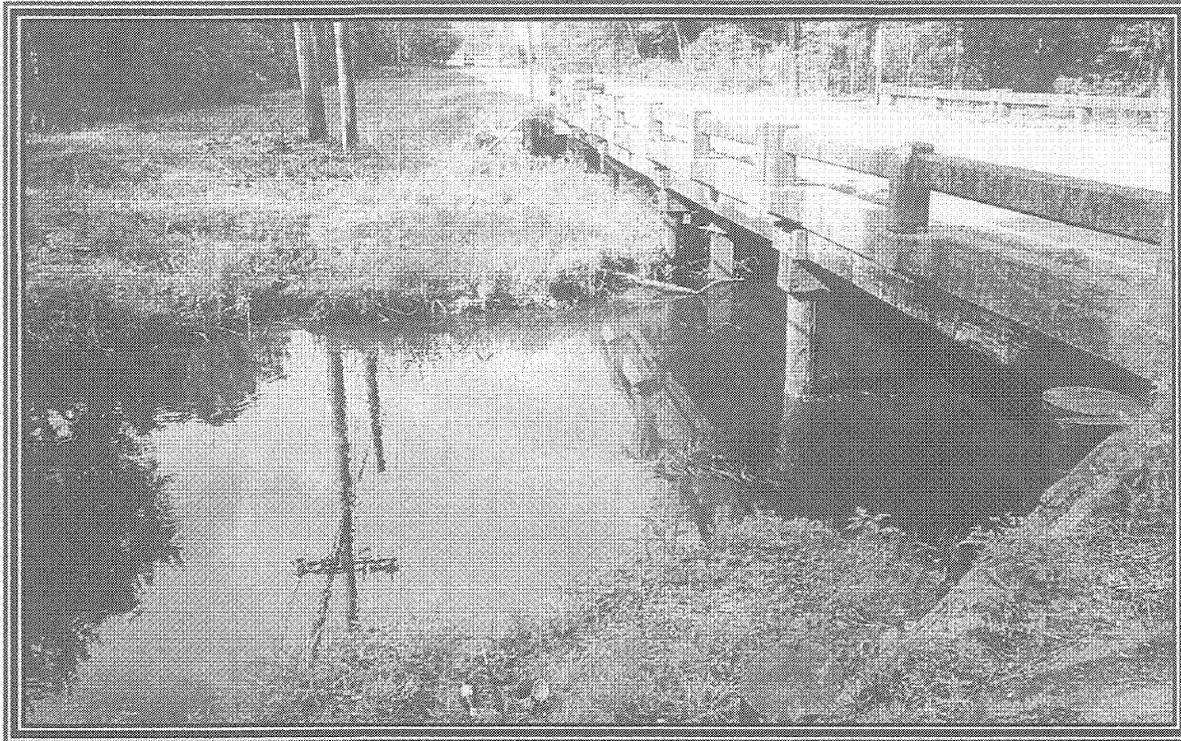
**CUMBERLAND  
COUNTY  
BRIDGE No. 80  
B-4092**



**Looking North  
on SR 1108**

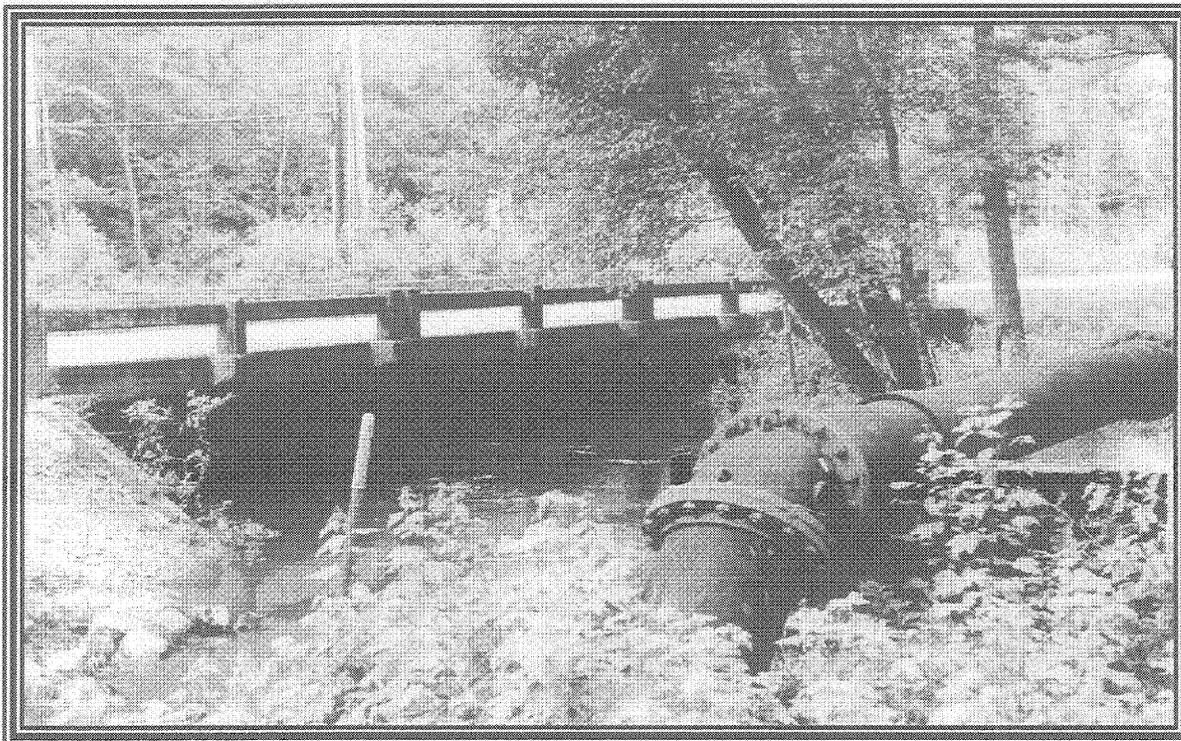


**Looking South  
on SR 1108**



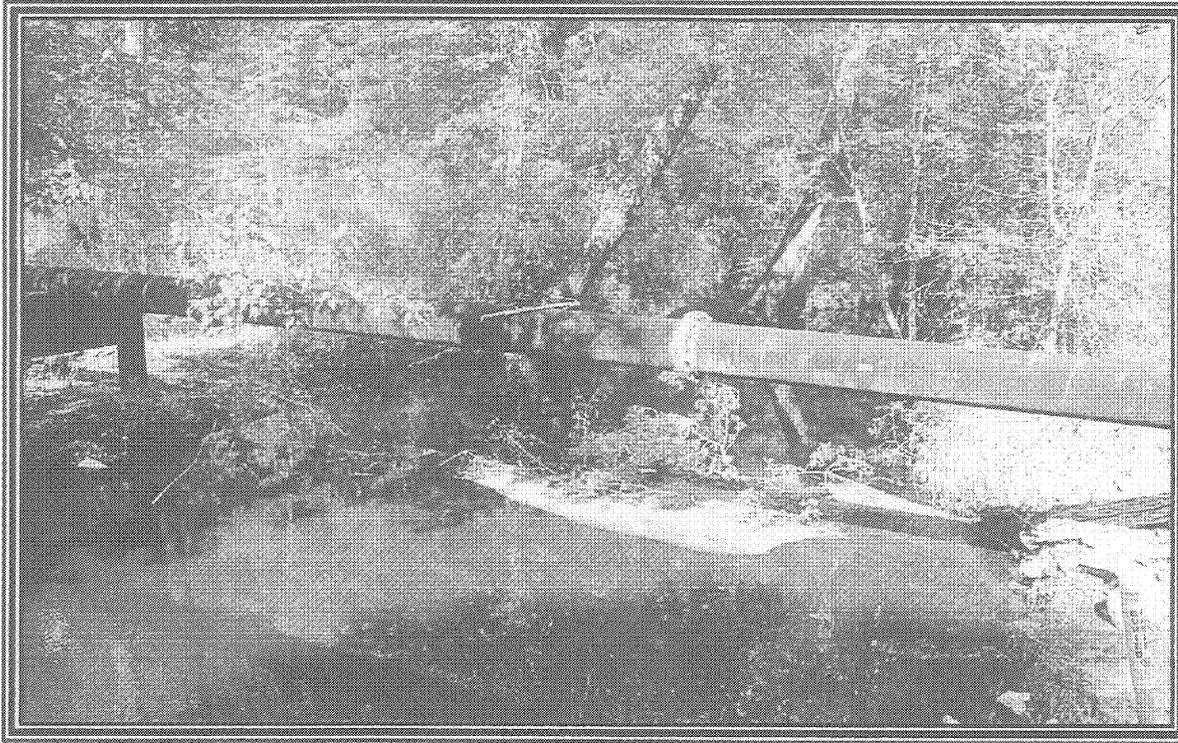
**CUMBERLAND  
COUNTY  
BRIDGE No. 80  
B-4092**

**Looking at  
West Side of  
Bridge No. 80**



**Looking at East  
Side of Bridge  
No. 80**

**FIGURE 4B**



**CUMBERLAND  
COUNTY  
BRIDGE No. 80  
B-4092**

**Looking  
Downstream at  
Little Rockfish  
Creek**

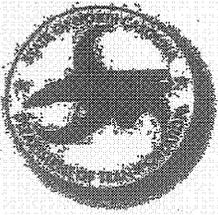


**Looking  
Upstream at  
Little Rockfish  
Creek**

**FIGURE 4C**



# APPENDIX



# Newsletter

**NCDOT**  
**T.I.P. B-4092**

Volume I, Issue I  
October 2005

## Proposed Replacement of Bridge No. 80 over Little Rockfish Creek on SR 1108 (Lakewood Drive)

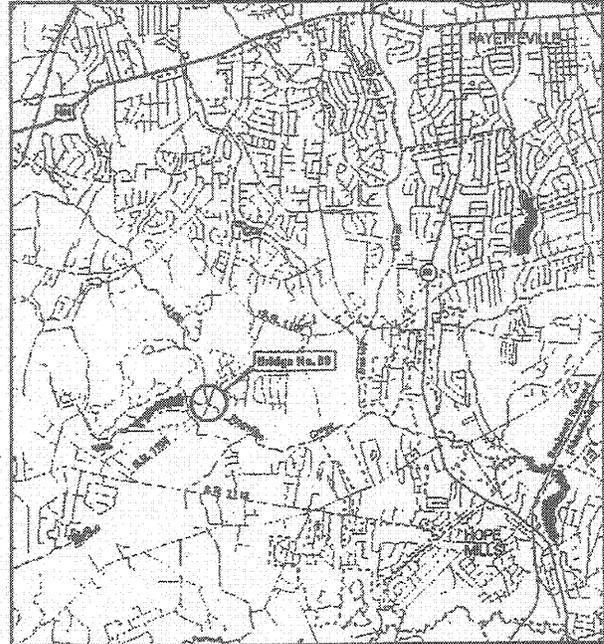
This newsletter is published by the North Carolina Department of Transportation to provide information on the status of the proposed replacement of the bridge over Little Rockfish Creek on SR 1108 (Lakewood Drive) illustrated in the vicinity map to the right. The proposed project is needed to improve safety due to the deteriorated condition of the existing bridge.

### PROJECT SCHEDULE

The acquisition of right-of-way is scheduled for federal fiscal year (FFY) 2005, with construction in FFY 2006.

### CITIZENS INFORMATIONAL WORKSHOP

You are invited to a citizen's informational workshop on December 5, 2005 from 5:00 pm to 7:00 pm at Jack Britt High School, 7304 Rockfish Road, Fayetteville. This workshop will provide citizens the opportunity to comment on the three (3) alternatives for this project. Alternative 1 proposes to replace the bridge in its existing location. Alternative 1 would utilize an off-site detour to maintain traffic during a shortened construction period. The proposed off-site detour route is SR 1108 (Lakewood Drive) to SR 1107 (Fisher Road) to SR 1104 (Strickland Bridge Road) to SR 1109 (Dundle Road) to SR 1100 (Stony Point Road) and back to SR 1108 (Lakewood Drive). Alternative 2 also proposes to replace the bridge in its existing location. Alternative 2 would maintain traffic with an on-site detour on the downstream (east) side of the existing bridge during construction. Alternative 3 also proposes to replace the bridge in its existing location. Alternative 3 would maintain traffic with an on-site detour on the upstream (west) side of the existing bridge during construction. Please see the figures shown on the back of this newsletter.



### NCDOT WELCOMES CITIZEN INPUT

Public involvement is an important part of the planning process. The North Carolina Department of Transportation is committed to ensuring all issues of concern to the public are addressed and considered before any recommendations or decisions are made. If you have any questions or comments concerning the project, please feel free to contact the study team members below:

Mr. Vincent J. Rhea, PE  
Project Manager  
NCDOT-PDEA  
1548 Mail Service Center  
Raleigh, NC 27699-1548  
(919) 733-7844 ext. 261  
[vrhea@dot.state.nc.us](mailto:vrhea@dot.state.nc.us)

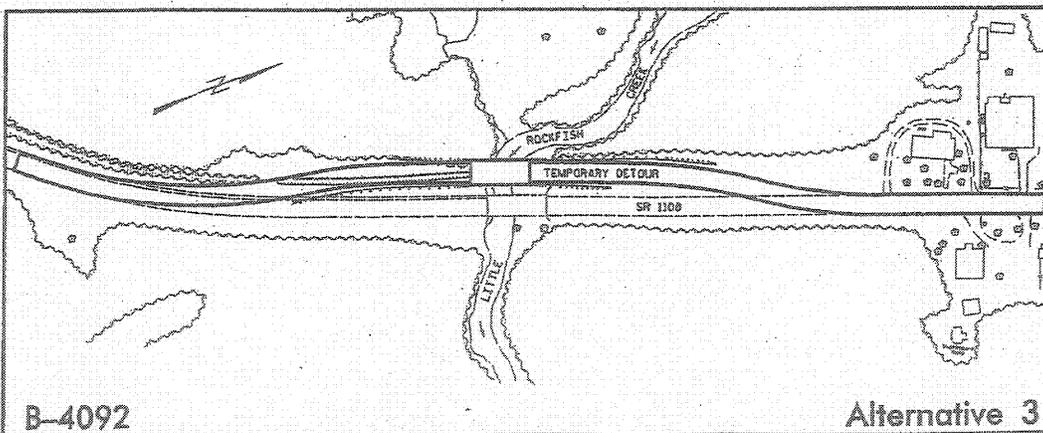
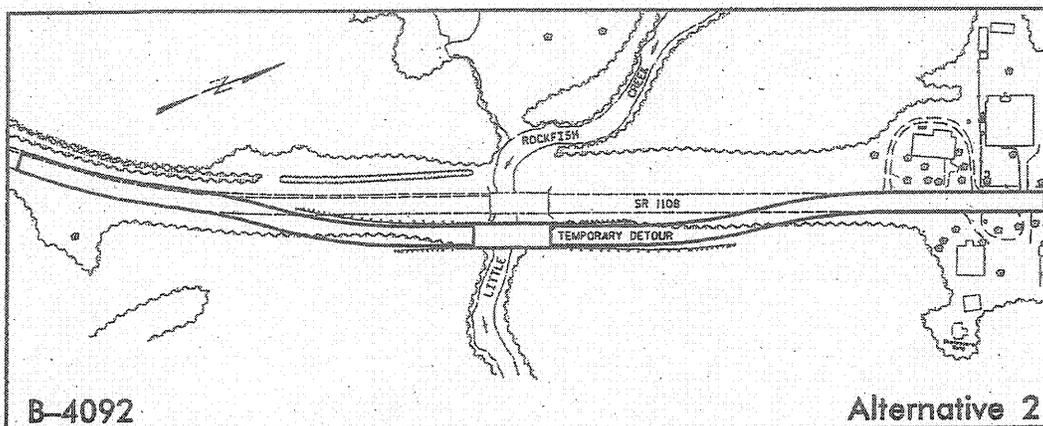
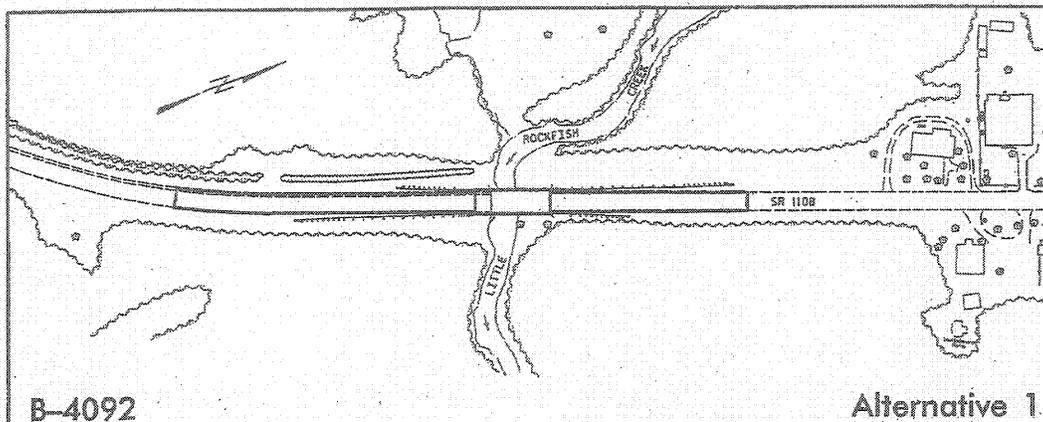
Mr. Richard Davis  
Project Manager  
The LPA GROUP of North Carolina, P.A.  
4904 Professional Ct., Suite 201  
Raleigh, NC 27609  
(919) 954-1244  
[rdavis@lpagroup.com](mailto:rdavis@lpagroup.com)



NCDOT  
T.I.P. B-4092

North Carolina Department of Transportation  
Project Development & Environmental Branch  
1548 Mail Service Center  
Raleigh, NC 27699-1548

## Postal Customer



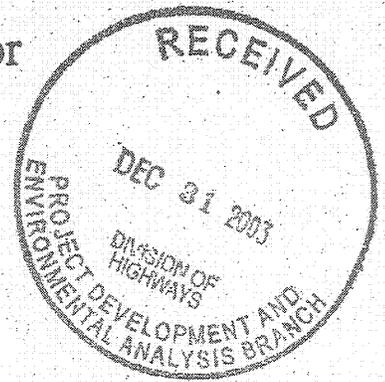


# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Raleigh Field Office  
Post Office Box 33726  
Raleigh, North Carolina 27636-3726

December 30, 2003



Gregory J. Thorpe, Ph.D.  
North Carolina Department of Transportation  
Project Development and Environmental Analysis  
1548 Mail Service Center  
Raleigh, NC 27699-1548

Dear Dr. Thorpe:

This letter is in response to your request for comments from the U.S. Fish and Wildlife Service (Service) on the potential environmental impacts of the proposed replacement of Bridge No. 80 on SR 1108 over Little Rockfish Creek, Cumberland County, North Carolina (TIP No. B-4092). These comments provide scoping information in accordance with provisions of the Fish and Wildlife Coordination Act (16 U.S.C. 661-667d) and section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543).

For bridge replacement projects, the Service recommends the following general conservation measures to avoid or minimize environmental impacts to fish and wildlife resources:

1. Wetland, forest and designated riparian buffer impacts should be avoided and minimized to the maximum extent practical;
2. If unavoidable wetland impacts are proposed, every effort should be made to identify compensatory mitigation sites in advance. Project planning should include a detailed compensatory mitigation plan for offsetting unavoidable wetland impacts. Opportunities to protect mitigation areas in perpetuity via conservation easements, land trusts or by other means should be explored at the outset;
3. Off-site detours should be used rather than construction of temporary, on-site bridges. For projects requiring an on-site detour in wetlands or open water, such detours should be aligned along the side of the existing structure which has the least and/or least quality of fish and wildlife habitat. At the completion of construction, the detour area should be entirely removed and the impacted areas be planted with appropriate vegetation, including trees if necessary;
4. Wherever appropriate, construction in sensitive areas should occur outside fish spawning and migratory bird nesting seasons. In waterways that may serve as travel corridors for

fish, in-water work should be avoided during moratorium periods associated with migration, spawning and sensitive pre-adult life stages. The general moratorium period for anadromous fish is February 15 - June 30;

5. New bridges should be long enough to allow for sufficient wildlife passage along stream corridors;
6. Best Management Practices (BMP) for Protection of Surface Waters should be implemented;
7. Bridge designs should include provisions for roadbed and deck drainage to flow through a vegetated buffer prior to reaching the affected stream. This buffer should be large enough to alleviate any potential effects from run-off of storm water and pollutants;
8. The bridge designs should not alter the natural stream and stream-bank morphology or impede fish passage. To the extent possible, piers and bents should be placed outside the bank-full width of the stream;
9. Bridges and approaches should be designed to avoid any fill that will result in damming or constriction of the channel or flood plain. If spanning the flood plain is not feasible, culverts should be installed in the flood plain portion of the approach to restore some of the hydrological functions of the flood plain and reduce high velocities of flood waters within the affected area.

Enclosed with this letter is a list of federally threatened and endangered species for Cumberland County. Although the North Carolina Natural Heritage Program (NCNHP) database does not indicate any known occurrences of these species near the project vicinity, use of the NCNHP data should not be substituted for actual field surveys if suitable habitat occurs near the project site. The NCNHP database only indicates the presence of known occurrences of federally protected species and does not necessarily mean that such species are not present. It may simply mean that the area has not been surveyed. Information about the habitats in which these species are often found is provided on our web site, <http://endangered.fws.gov/>. If suitable habitat occurs within the project vicinity for any of the listed species, surveys should be conducted to determine presence or absence of the species. All survey documentation must include survey methodologies and results.

We reserve the right to review any federal permits that may be required for this project, at the public notice stage. Therefore, it is important that resource agency coordination occur early in the planning process in order to resolve any conflicts that may arise and minimize delays in project implementation. In addition to the above guidance, we recommend that the environmental documentation for this project include the following in sufficient detail to facilitate a thorough review of the action:

1. A clearly defined and detailed purpose and need for the proposed project;

2. A description of the proposed action with an analysis of all alternatives being considered, including the "no action" alternative;
3. A description of the fish and wildlife resources, and their habitats, within the project impact area that may be directly or indirectly affected;
4. The extent and acreage of waters of the U.S., including wetlands, that are to be impacted by filling, dredging, clearing, ditching, or draining. Acres of wetland impact should be differentiated by habitat type based on the wetland classification scheme of the National Wetlands Inventory (NWI). Wetland boundaries should be determined by using the 1987 Corps of Engineers Wetlands Delineation Manual and verified by the U.S. Army Corps of Engineers;
5. The anticipated environmental impacts, both temporary and permanent, that would be likely to occur as a direct result of the proposed project. The assessment should also include the extent to which the proposed project would result in secondary impacts to natural resources, and how this and similar projects contribute to cumulative adverse effects;
6. Design features and construction techniques which would be employed to avoid or minimize the fragmentation or direct loss of wildlife habitat and waters of the US;
7. If unavoidable wetland impacts are proposed, project planning should include a detailed compensatory mitigation plan for offsetting the unavoidable impacts.

The Service appreciates the opportunity to comment on this project. Please continue to advise us during the progression of the planning process, including your official determination of the impacts of this project. If you have any questions regarding our response, please contact Mr. Gary Jordan at (919) 856-4520, ext. 32.

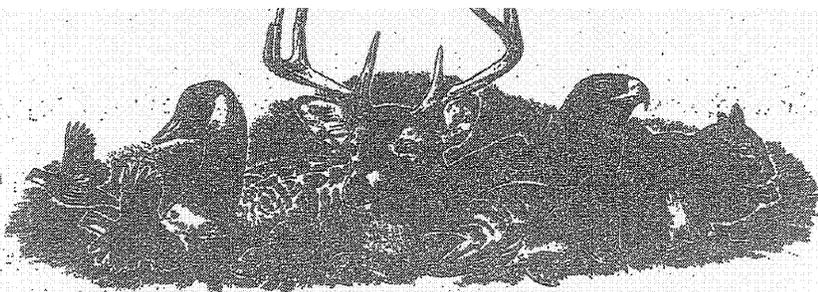
Sincerely,



Garland B. Pardue, Ph.D.  
Ecological Services Supervisor

enclosure:

cc: Richard Spencer, USACE, Wilmington, NC  
David Franklin, USACE, Wilmington, NC  
Beth Barnes, NCDWQ, Raleigh, NC  
Travis Wilson, NCWRC, Creedmoor, NC  
Chris Militscher, USEPA, Raleigh, NC



# North Carolina Wildlife Resources Commission

Charles R. Fullwood, Executive Director

## MEMORANDUM

TO: Vincent J. Rhea  
Project Development and Environmental Analysis Branch, NCDOT

FROM: Travis Wilson, Highway Project Coordinator   
Habitat Conservation Program

DATE: February 5, 2004

SUBJECT: NCDOT Bridge Replacements in Johnston, Moore, Montgomery, Brunswick, Bladen, Cumberland, Scotland, and Columbus counties. TIP Nos. B-4165, B-4207, B-4204, B-4030, B-4029, B-4092, B-4274, B-4080, and B-4078.

Biologists with the N. C. Wildlife Resources Commission (NCWRC) have reviewed the information provided and have the following preliminary comments on the subject project. Our comments are provided in accordance with provisions of the National Environmental Policy Act (42 U.S.C. 4332(2)(c)) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-667d).

Our standard recommendations for bridge replacement projects of this scope are as follows:

1. We generally prefer spanning structures. Spanning structures usually do not require work within the stream and do not require stream channel realignment. The horizontal and vertical clearances provided by bridges allows for human and wildlife passage beneath the structure, does not block fish passage, and does not block navigation by canoeists and boaters.
2. Bridge deck drains should not discharge directly into the stream.
3. Live concrete should not be allowed to contact the water in or entering into the stream.
4. If possible, bridge supports (bents) should not be placed in the stream.

5. If temporary access roads or detours are constructed, they should be removed back to original ground elevations immediately upon the completion of the project. Disturbed areas should be seeded or mulched to stabilize the soil and native tree species should be planted with a spacing of not more than 10'x10'. If possible, when using temporary structures the area should be cleared but not grubbed. Clearing the area with chain saws, mowers, bush-hogs, or other mechanized equipment and leaving the stumps and root mat intact, allows the area to revegetate naturally and minimizes disturbed soil.
6. A clear bank (riprap free) area of at least 10 feet should remain on each side of the stream underneath the bridge.
7. In trout waters, the N.C. Wildlife Resources Commission reviews all U.S. Army Corps of Engineers nationwide and general '404' permits. We have the option of requesting additional measures to protect trout and trout habitat and we can recommend that the project require an individual '404' permit.
8. In streams that contain threatened or endangered species, NCDOT biologist Mr. Hal Bain should be notified. Special measures to protect these sensitive species may be required. NCDOT should also contact the U.S. Fish and Wildlife Service for information on requirements of the Endangered Species Act as it relates to the project.
9. In streams that are used by anadromous fish, the NCDOT official policy entitled "Stream Crossing Guidelines for Anadromous Fish Passage (May 12, 1997)" should be followed.
10. In areas with significant fisheries for sunfish, seasonal exclusions may also be recommended.
11. Sedimentation and erosion control measures sufficient to protect aquatic resources must be implemented prior to any ground disturbing activities. Structures should be maintained regularly, especially following rainfall events.
12. Temporary or permanent herbaceous vegetation should be planted on all bare soil within 15 days of ground disturbing activities to provide long-term erosion control.
13. All work in or adjacent to stream waters should be conducted in a dry work area. Sandbags, rock berms, cofferdams, or other diversion structures should be used where possible to prevent excavation in flowing water.
14. Heavy equipment should be operated from the bank rather than in stream channels in order to minimize sedimentation and reduce the likelihood of introducing other pollutants into streams.
15. Only clean, sediment-free rock should be used as temporary fill (causeways), and should be removed without excessive disturbance of the natural stream bottom when construction is completed.
16. During subsurface investigations, equipment should be inspected daily and maintained to prevent contamination of surface waters from leaking fuels, lubricants, hydraulic fluids, or other toxic materials.

If corrugated metal pipe arches, reinforced concrete pipes, or concrete box culverts are used:

1. The culvert must be designed to allow for aquatic life and fish passage. Generally, the culvert or pipe invert should be buried at least 1 foot below the natural streambed (measured from the natural thalweg depth). If multiple barrels are required, barrels other than the base flow barrel(s) should be placed on or near stream bankfull or floodplain bench elevation (similar to Lyonsfield design). These should be reconnected to floodplain benches as appropriate. This may be accomplished by utilizing sills on the upstream and downstream ends to restrict or divert flow to the base flow barrel(s). Silled barrels should be filled with sediment so as not to cause noxious or mosquito breeding conditions. Sufficient water depth should be provided in the base flow barrel(s) during low flows to accommodate fish movement. If culverts are longer than 40-50 linear feet, alternating or notched baffles should be installed in a manner that mimics existing stream pattern. This should enhance aquatic life passage: 1) by depositing sediments in the barrel, 2) by maintaining channel depth and flow regimes, and 3) by providing resting places for fish and other aquatic organisms. In essence, base flow barrel(s) should provide a continuum of water depth and channel width without substantial modifications of velocity.
2. If multiple pipes or cells are used, at least one pipe or box should be designed to remain dry during normal flows to allow for wildlife passage.
3. Culverts or pipes should be situated along the existing channel alignment whenever possible to avoid channel realignment. Widening the stream channel must be avoided. Stream channel widening at the inlet or outlet end of structures typically decreases water velocity causing sediment deposition that requires increased maintenance and disrupts aquatic life passage.
4. Riprap should not be placed in the active thalweg channel or placed in the streambed in a manner that precludes aquatic life passage. Bioengineering boulders or structures should be professionally designed, sized, and installed.

In most cases, we prefer the replacement of the existing structure at the same location with road closure. If road closure is not feasible, a temporary detour should be designed and located to avoid wetland impacts, minimize the need for clearing and to avoid destabilizing stream banks. If the structure will be on a new alignment, the old structure should be removed and the approach fills removed from the 100-year floodplain. Approach fills should be removed down to the natural ground elevation. The area should be stabilized with grass and planted with native tree species. If the area reclaimed was previously wetlands, NCDOT should restore the area to wetlands. If successful, the site may be utilized as mitigation for the subject project or other projects in the watershed.

#### Project specific comments:

1. B-4165, Johnston County, Bridge No. 89 over Sassarixa Swamp on SR 1162. We recommend replacing this bridge with a bridge. Standard recommendations apply.
2. B-4207, Moore County, Bridge No. 43 over McLendons Creek on NC 22-24-27. We recommend replacing this bridge with a bridge. McLendons Creek contains habitat suitable for the federally endangered Cape Fear shiner, a survey should be conducted to determine the presence or absence of this species. Standard recommendations apply.

3. B-4204, Montgomery County, Bridge No. 28 over Rock Creek on NC 109. We recommend replacing this bridge with a bridge. Standard recommendations apply.
4. B-4030, Brunswick County, Bridge No. 9 over Bear Branch on NC 103. We recommend replacing this bridge with a bridge. Standard recommendations apply.
5. B-4029, Bladen County, Bridge No. 8 over canal on NC 210. We recommend replacing this bridge with a bridge. Standard recommendations apply.
6. B-4092, Cumberland County, Bridge No. 80 over Little Rockfish Creek on SR 1108. We recommend replacing this bridge with a bridge. A significant fishery for sunfish exists at this site, therefore we request in in-water work moratorium for sunfish from April 1 to June 30. Standard recommendations apply.
7. B-4274, Scotland County, Bridge No. 14 over Big Shoe Heel Creek on NC 144. We recommend replacing this bridge with a bridge. A significant fishery for sunfish exists at this site, therefore we request in in-water work moratorium for sunfish from April 1 to June 30. Standard recommendations apply.
8. B-4080, Columbus County, Bridge No. 148 over Pine Log Swamp on SR 1437. We recommend replacing this bridge with a bridge. Standard recommendations apply.
9. B-4078, Columbus County, Bridge No. 10 over Waccamaw River Overflow on NC 130. We recommend replacing this bridge with a bridge. Standard recommendations apply.

NCDOT should routinely minimize adverse impacts to fish and wildlife resources in the vicinity of bridge replacements. Restoring previously disturbed floodplain benches should narrow and deepen streams previously widened and shallowed during initial bridge installation. NCDOT should install and maintain sedimentation control measures throughout the life of the project and prevent wet concrete from contacting water in or entering into these streams. Replacement of bridges with spanning structures of some type, as opposed to pipe or box culverts, is recommended in most cases. Spanning structures allow wildlife passage along streambanks and reduce habitat fragmentation.

If you need further assistance or information on NCWRC concerns regarding bridge replacements, please contact me at (919) 528-9886. Thank you for the opportunity to review and comment on these projects.

Cc: Gary Jordan, U.S. Fish and Wildlife Service, Raleigh



**North Carolina Department of Cultural Resources  
State Historic Preservation Office**

Michael F. Easley, Governor  
Lisbeth C. Evans, Secretary  
Jeffrey J. Crow, Deputy Secretary  
Office of Archives and History

Division of Historical Resources  
David L. S. Brook, Director

February 18, 2004

**MEMORANDUM**

**TO:** Vincent J. Rhea, P.E.  
Project Development and Environmental Analysis  
NCDOT Division of Highways

**FROM:** David Brook *for David Brook*

**SUBJECT:** Bridge No. 14 on NC 144 (formerly SR 1405), over Big Shoe Heel Creek, B-4274,  
Scotland County, ER03-3643  
Bridge No. 80 on SR 1108 over Little Rockfish Creek, B-4092,  
Cumberland County, ER03-3636  
Bridge No. 28 on NC 109 over Rock Creek, B-4204,  
Montgomery County, ER03-3641  
Bridge No. 43 on NC 22-24-27 over McLendons Creek, B-4207,  
Moore County, ER03-3642

Thank you for your letters of December 8, 2004, concerning the above projects.

We are unable to comment on the potential effect of these projects on cultural historic resources until we receive further information.

Please forward a labeled 7.5 minute USGS quadrangle map for each of the above projects clearly indicating the project vicinity, location, and termini. In addition, please include the name of the quadrangle map.

For all projects except B-4207 in Moore County, there are no known archaeological sites within the proposed project area. Based on our knowledge of the area, it is unlikely that any archaeological resources that may be eligible for conclusion in the National Register of Historic Places will be affected by the project. We, therefore, recommend that no archaeological investigation be conducted in connection with this project.

Due to the on site detours to the north or south of B-4207, Moore County, we recommend that a comprehensive survey be conducted by an experienced archaeologist. The survey will identify and evaluate the significance of archaeological remains that may be damaged or destroyed by the proposed project. Potential effects on unknown resources must be assessed prior to the initiation of construction activities. Off site detours generally preclude the need for an archaeological survey of a bridge to be rebuilt on the same alignment.

[www.hpo.dcr.state.nc.us](http://www.hpo.dcr.state.nc.us)

	Location	Mailing Address	Telephone/Fax
ADMINISTRATION	507 N. Blount St, Raleigh, NC	4617 Mail Service Center, Raleigh, NC 27699-4617	(919) 733-4763 • 733-8653
RESTORATION	515 N. Blount St, Raleigh, NC	4617 Mail Service Center, Raleigh, NC 27699-4617	(919) 733-6547 • 715-4801
SURVEY & PLANNING	515 N. Blount St, Raleigh, NC	4617 Mail Service Center, Raleigh, NC 27699-4617	(919) 733-4763 • 715-4801

February 18, 2004

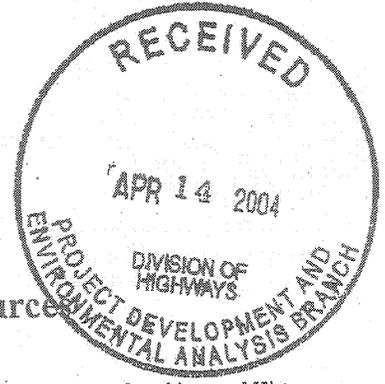
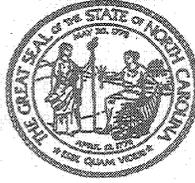
Page 2

Two copies of the resulting archaeological survey report, as well as one copy of the appropriate site forms, should be forwarded to us for review and comment as soon as they are available and well in advance of any construction activities.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Eatley, environmental review coordinator, at 919/733-4763. In all future communication concerning this project, please cite the above referenced tracking number.

cc: Mary Pope Furr, NCDOT  
Matt Wilkerson, NCDOT  
John F. Sullivan, FWHA  
Rodney J. Snedeker, Archaeologist, National Forests in NC



North Carolina Department of Cultural Resources  
State Historic Preservation Office  
David L.S. Brook, Administrator

Michael F. Easley, Governor  
Lisbeth C. Evans, Secretary  
Jeffrey J. Crow, Deputy Secretary

Office of Archives and History  
Division of Historical Resources

April 5, 2004

MEMORANDUM

To: Greg Thorpe, Manager  
Project Development and Environmental Analysis Branch  
Division of Highways  
Department of Transportation

From: David Brook

Re: Proposed Replacement of Bridge 80 on SR 1108 over Little Rockfish Creek, B-4092, Cumberland County, ER 03-3636

This memorandum is to replace our comments of February 18, 2004, concerning archaeological resources in the project area.

Due to the possibility of new location alignments and on-site detours to the east or west, we recommend that an experienced archaeologist conduct a comprehensive survey of the area of potential effect. The survey should identify and evaluate the significance of archaeological remains that may be damaged or destroyed by the proposed project. Potential effects on unknown resources must be assessed prior to the initiation of construction activities. Off-site detours generally preclude the need for an archaeological survey for a bridge to be rebuilt on the same alignment.

Two copies of the resulting archaeological survey report, as well as one copy of the appropriate site forms, should be forwarded to us for review and comment as soon as they are available and well in advance of any construction activities.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763. In all future communication concerning this project, please cite the above-referenced tracking number.

cc: Matt Wilkerson, NCDOT

Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763. In all future communication concerning this project, please cite the above-referenced tracking number.

cc: Mary Pope Furr  
Matt Wilkerson

# Cumberland County Schools

P.O. Box 2357  
Fayetteville, North Carolina 28302  
910-678-2300

WILLIAM C. HARRISON, Ed. D.  
SUPERINTENDENT

MARY EMILY ROYAL  
DIANE WHEATLEY  
JAMES M. WILLIAMS  
MILTON J. YARBORO

MICHAEL C. BOOSE, CHAIRMAN  
MACKY HALL, VICE CHAIRMAN  
HELEN H. FARRIOR  
RICHARD B. GLAZIER  
LARRY LANCASTER

August 26, 2002

To: William T. Goodwin, Jr. PE ✓  
Davis Moore  
Project Development & Environmental Analysis Branch

From: Michael W. Clover, Ed.D. *mc*  
Executive Director of Transportation  
Cumberland County Schools

Subject: Replacement of Bridge No. 80 on SR 1108 over Little Rockfish Creek,  
Cumberland County

In reference to your memorandum dated August 21, 2002 in regards to the above mentioned bridge project, the Cumberland County Schools community would be severely disrupted by this project unless there is an on-site detour. We currently have 34 bus crossings per day at this site. The bridge is located between Jack Britt High School (pop. 1762+ students) and John Griffin Middle School (pop. 1094+ students). There are also two elementary schools in close proximity to this bridge, which creates a great deal of car traffic in addition to the bus traffic in the area. Projected growth in this community will increase the traffic to our schools which would create an unworkable situation for school bus operations due to time constraints and distance that would be involved in detouring to other local roads.

I feel very strongly that an on-site detour would be a necessity for this project due to the high volume of traffic, both cars and buses, generated as a result of the four schools located in this area. Thank you for requesting our input in this project and please continue to keep me informed.

If I can be of further assistance please feel free to contact me.

Davis, Richard

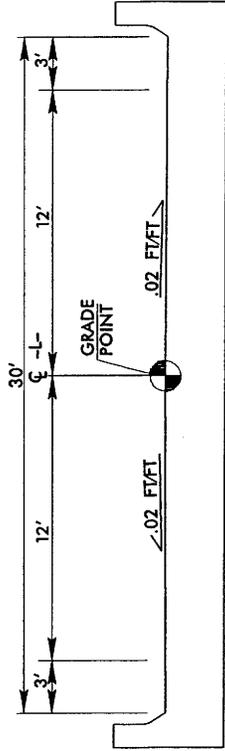
---

From: Vincent J Rhea, P.E. [vrhea@dot.state.nc.us]  
Sent: Thursday, January 08, 2004 8:08 AM  
To: Richard Davis  
Subject: B-4092

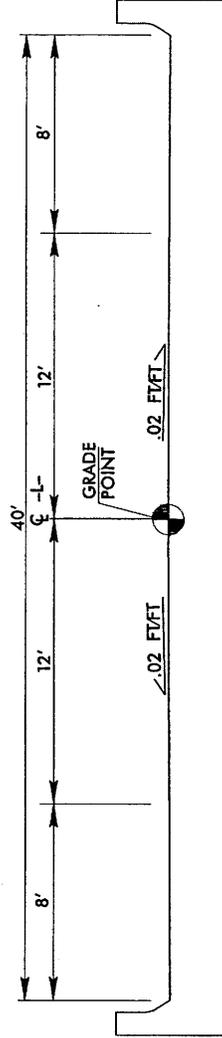
Richard

I got a message this morning from Phillip Molland (919-678-2586) with the Cumberland County school bus garage. He says that they currently have 82 school bus crossings per day over B-4092. We will have to make sure our temporary detour is up to this.

Vince



**TYPICAL TEMPORARY BRIDGE SECTION**



**TYPICAL BRIDGE SECTION**



North Carolina Department of Transportation  
 Project Development and  
 Environmental Analysis Branch

Replace Bridge No. 80 on S.R. 1108  
 Over Little Rockfish Creek  
 Cumberland County  
 B-4092

NOT TO SCALE

Figure 3B