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Agriculture**

**Forest Service**

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# **Environmental Assessment**

## **Calestown Road, Mitchumtown Road, Green Bay Road, and Spring Pond Road**

**Francis Marion Ranger District, Francis Marion National Forest  
Berkeley County, South Carolina**

**Location of Action:** Francis Marion Ranger District, Francis Marion National Forest

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## **CHAPTER ONE – PURPOSE AND NEED FOR PROPOSED ACTION**

### **1.1 Introduction**

The Francis Marion National Forest (FMNF) proposes to initiate a proposal from Berkeley County for a public road easement and to apply surface paving improvements to four sections of roadway along Green Bay Road, Mitchumtown Road, Calestown Road, and Spring Pond Road for a total of 3.4 miles (see Figures 1-4). The project area is located in the western portion of the FMNF in Berkeley County, South Carolina. If road paving is approved, an easement would be issued to Berkeley County to construct, operate, and maintain paved roads in these locations. Currently these roads are maintained by Berkeley County under a cooperative road maintenance agreement because there are citizens that live along the roads. A Federal Roads and Trails Easement (FRTA), 16 U.S.C. 533 easement would effectively remove these portions of the roadway corridor from Forest Service use and they would be maintained by Berkeley County.

Due to the limited scope of the project, potential effects of the proposed action are relatively limited in nature. Potential effects include an increase in speed of vehicular traffic and subsequently the frequency and severity of accidents.

The environmental assessment (EA) will document the potential environmental impacts that may occur as result of the Proposed Action. The EA will be prepared in compliance with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code (USC) 4321 et seq.), which requires an environmental analysis for Federal actions having the potential to impact the quality of the human environment; the Council on Environmental Quality (CEQ) Regulations (40 Code of Federal Regulations (CFR) 1500 through 1508) for implementing NEPA; USDA's NEPA Policies and Procedures (7 CFR Part 1b); Forest Service Manual (FSM) 1950; and Forest Service Handbook (FSH) 1909.15.

### **1.2 Background**

The FMNF is located in southeastern South Carolina, in Berkeley and Charleston counties. These counties are a part of what is commonly referred to as the "Lowcountry", which is a term to describe the state's low lying counties along the Atlantic Coastal Plain. Elevations range from 0 to 80 feet above sea level.

This region is characterized by sub xeric sandy ridges, poorly drained flatwoods, swamps, savannas/seeps, upland depressions, ephemeral drains and isolated wetlands. The forest types include loblolly pine, longleaf pine, mixed loblolly-longleaf pine, pond pine, hardwood (sweetgum, maple, hickory, and bald cypress etc.) and mixed pine hardwood forest types.

There are numerous state, local, and Forest Service roads within the proclamation boundary. They serve as arterial, collector, and local routes, with a total of approximately 557 miles of National Forest system roads (Road Analysis, 2003). Other roads are owned by the County, private owners, or have unknown ownership. These roads vary from single lane dirt roads to multi-lane paved and striped facilities. Roads provide access to the National Forest system lands including recreational sites, residential houses, and prescribed burn sites. They also serve commercial traffic, hurricane evacuees, postal carriers, and school buses.

### **1.3 Proposed Action**

The proposed action would consist of the FMNF initiating a proposal from Berkeley County for a public road easement. This easement would be to apply surface paving improvements to four sections of roadway along Green Bay Road, Mitchumtown Road, Calestown Road, and Spring Pond Road for a total of 3.4 miles. If road paving is approved, an easement would be issued to Berkeley County to construct, operate, and maintain a paved road. An associated action of relocating overhead powerlines is also required by Berkeley Electric Cooperative (BEC), Incorporated to allow for roadway construction. Powerlines would be relocated along Calestown Road and Mitchumtown Road. The relocation will be addressed in an Amendment to an existing permit issued to BEC.

### **1.4 Purpose and Need**

The purpose of this initiative is to respond to a request from Berkeley County. This action is needed to improve the roads leading to private residences and to reduce road maintenance costs for Berkeley County. The existing dirt roads are in a state of great disrepair and are not fully serving their intended purpose as a safe and efficient means of travel for the public. Road widths are very narrow and in many locations do not allow for two cars to safely pass each other. Paving will not provide for additional traffic volumes. Current volumes are very low, primarily consisting of local residents accessing their homes. Safer, two-lane roads are needed to prevent vehicle conflicts among residents, emergency response personnel, and Forest Service staff. This action responds to the goals and objectives outlined in the Revised Land and Resource Management Plan for the FMNF (Forest Plan).

### **1.5 Scoping**

The formal scoping period for this project began in May 2011. A letter describing the proposed action, the purpose and need and requesting public input was sent to individuals and agencies included on a District mailing list on June 21, 2011. Two comments were received (included in the appendices) during scoping and used to refine the proposed action. No comments were received during the 30-day notice and comment period.

### **1.6 Decision to be Made**

The EA discloses environmental effects of the proposed action and the no action alternative. The responsible official, the Forest Supervisor, will make a decision based on a review of the EA. The Forest Supervisor must decide:

1. Whether to proceed with the proposed action or the “No Action” alternative.

2. Whether the decision that is selected will have a significant impact on the quality of the human environment or not. If a determination is made that the impact is not significant, then a “Finding of No Significant Impact” (FONSI) would be prepared. Significant impacts on the quality of the human environment would require the preparation of an Environmental Impact Statement [NEPA, 1501.4 (c) and (e).] The decision will be documented in a Decision Notice (FSH, 1909.15, 43.2) signed by the Forest Supervisor.

## CHAPTER TWO - ALTERNATIVES

This section discusses alternatives to meet the purpose and need discussed in Chapter 1. Two alternatives are analyzed, including the No Action alternative.

### 2.1 Alternative 1. No action

Under the No Action alternative, existing roads would remain in their current state and would continue to be managed under the existing roadways agreement. The roads would remain unpaved and would require regular maintenance for grading, filling of large and small voids, and routine maintenance. There is currently no agreement for these specific roadways sections, therefore there are no defined conditions for maintenance, herbicide use, and other routine activities to maintain the facility.

### 2.2 Alternative 2. The proposed action

The FMNF proposes to move forward on a proposal from Berkeley County for a public road easement and to apply surface improvements to approximately 3.4 miles of existing roadway along Green Bay Road, Mitchumtown Road, Calestown Road, and Spring Pond Road. Paving would include 0.93 miles of Spring Pond Road, 1.45 miles of Calestown Road, 1.54 miles of Mitchumtown Road, and 0.42 miles of Green Bay Road. The project area is located in the western portion of the Francis Marion Ranger District in Berkeley County, South Carolina. This action is needed to respond to a special use request from Berkeley County.

Connected actions with the proposal include the relocation of overhead power lines maintained by Berkeley Electric Cooperative to maintain service in conjunction with road paving activities.

These roads currently consist of unpaved compacted sediments with little-to-no roadway shoulders. Some spot treatments with gravel fill are also present to combat excessive “pot-holing” of the roadway. To repair this damage, Berkeley County is proposing to pave the existing roadway with two 11-foot lanes. Associated unpaved drainage ditches would also be included adjacent to the roadway to capture and convey surface water flow during storm events.

The roads would be managed under a special use permit with the U.S. Forest Service and Berkeley County; powerlines would be managed under a special use permit amendment to Berkeley Electric Cooperative, Inc. along Calestown Road and Mitchumtown Road.

**Calestown Road (See Figure 1)** – A portion of Calestown Road would be paved from the intersection with North Highway 17-A (US 17-A) for a distance of approximately 1.45 miles. Calestown Road intersects US 17-A approximately 3,800 linear feet from the intersection with Santee River Road (SC 45). The portion of the project within the FMNF includes approximately 3,000 linear feet from the intersection with US 17-A to near Hidden Pond Road (to west of the roadway) and to the west and east of the roadway near the southern end of the project limit. A 50 foot right-of-way width would be established for road maintenance. The overhead powerline along this road would be relocated and adjustments would be made to the current

right-of-way special use permit issued to Berkeley Electric Cooperative, Incorporated. Approximately 2.94 acres of National Forest system lands would be within the proposed right-of-way.

**Spring Pond Road (See Figure 2)** – Spring Pond Road would be paved from the intersection with US 17-A to its intersection with Santee River Road (SC 45), to include the intersection with Kinlaw Road (S-8-1308). The total segment length is 0.93 miles. This includes an extension of the originally proposed project limits that previously ended at Kinlaw Road. The portion of the project within FMNF land includes approximately 1,800 linear feet from the intersection with US 17-A to Kinlaw Road (to the south of the roadway). A 50 foot right-of-way width would be established for road maintenance. Approximately 1.03 acres of National Forest system lands would be within the proposed right-of-way.

**Mitchumtown Road (See Figure 3)** – Mitchumtown Road would be paved and receive related improvements from the intersection with Bethera Road (S-8-48) to its intersection with Brandon Road. The total segment length is 1.54 miles. The portion of the project within FMNF land includes 1,900 linear feet near the intersection with Bethera Road and near Raintree Lane, to the north and south of the roadway. A 50 foot right-of-way width would be established for road maintenance. The powerline along this road would be relocated and adjustments would be made to the current right-of-way special use permit issued to Berkeley Electric Cooperative, Incorporated. Approximately 2.18 acres of National Forest system lands would be within the proposed right-of-way.

**Green Bay Road (See Figure 4)** – Green Bay Road would be paved and receive related improvements from the intersection with United Drive (S-8-598) to the current end of county maintenance. The total segment length is 0.42 miles. The portion of the project within FMNF land includes 700 linear feet at the eastern extent of the project limit, to the north and south of the roadway. A 50 foot right-of-way width would be established for road maintenance. Approximately 0.80 acres of National Forest system lands would be within the proposed right-of-way.

### **2.3 Design Criteria**

Forest wide standards, guidelines, goals, and objectives are found in the *Revised Land and Resource Management Plan for the Francis Marion National Forest (1996)* and *South Carolina's Best Management Practices for Forestry (BMPs) (SCFC, 1994)*. Additional management requirements and mitigation measures can be found in the *Final Environmental Impact Statement, Vegetation Management in the Coastal Plain/Piedmont*, Chapter II.

The following Design Criteria would apply to Alternative Two.

1. Identified national register or eligible properties would be marked and avoided during site disturbing activities associated with road reconstruction and power line relocation. If cultural

resources are discovered during implementation, work would stop and the site would be evaluated for National Register eligibility.

2. Mechanical activities would not be conducted within 200 feet of RCW cavity trees during the RCW breeding season (April 1st – July 31st) to reduce the potential impact of disturbance on nesting activities. Mechanical activities within RCW clusters would only take place between one hour after sunrise and one hour before sunset.
3. There would be no movement of heavy equipment through RCW active cluster areas. There would be no staging or storing of materials in active RCW cluster areas. Heavy equipment would not operate within the drip line of any cavity trees.
4. No RCW cavity trees would be removed.
5. There would be no major impacts to nearby jurisdictional wetlands. BMPs would be used during construction to minimize temporary impacts. Roadway drainage would be contained within adjacent vegetated ditches. Ditches would not be blocked and should any temporary impacts occur, the ditches would be returned to normal function upon completion of project activities.
6. Equipment used in association with this project would be subject to equipment cleaning provisions to prevent the introduction and spread of non-native plants. Seeding and planting along the roadside would consist of native and non-invasive species and would be planted immediately following construction activities. Priority would be placed on using local and regional seed sources to include native perennial roadside plants.
7. Construction equipment and associated activities would stay within designated clearing limits while conducting work across National Forest system lands.
8. Seeding of annuals, native, and non-native perennial plants would occur as soon as possible on areas disturbed during project activities, particularly in areas near or adjacent to wetlands.
9. Erosion control measures such as silt fences, diversions, and temporary rock sediment dams would be installed to trap sediment in areas where runoff water has the potential to leave the project site. Erosion control devices would be maintained in working order throughout project activities and until plant growth is established and stable enough to control runoff and erosion.
10. The culvert near station point 62+00 on Mitchumtown Road would be replaced with a 60-inch structure with a natural bottom.

## 2.4 Comparison of Alternatives

Alternative Two, the proposed action alternative, would result in more impacts to the environment than Alternative One. Table 1 below summarizes the impacts to the environment. These impacts are further detailed in Chapter 3 of this document.

**Table 1. Comparison of Alternatives from the Berkeley County Road Paving Improvements**

Description	Alternative 1 – No Action	Alternative 2 – Proposed Action
Air Quality	Some dust would be produced during dry times from vehicle movement and road maintenance.	There would be a short-term minor increase in dust and vehicle exhaust during construction, There would be a long-term improvement by reducing dust from vehicle traffic and road maintenance.
Soils	Some soil would be lost through surface run-off during storm events.	Soils would be stabilized with the road paving, reducing the amount of surface soil that runs off into ditches and then into wetland areas. No hazardous materials or contaminated soils would be disturbed.
Water	Some soil would contribute to run-off from maintenance operations. The road would continue to flood after heavy rain events and rain events would continue to damage the existing roads.	Best Management Practices (BMPs) would be used to prevent direct and indirect impacts to surface water bodies. Excessive erosion from unpaved roadways would be prevented with a stabilized roadbed.
Vegetation	No changes	Some shrubs and trees would be removed along the existing road shoulders to accommodate two lanes and associated drainage features. Existing mature overstory tree canopy along the road would remain largely intact.

Description	Alternative 1 – No Action	Alternative 2 – Proposed Action
Wetlands	Some soil would contribute to run-off from maintenance operations. The road would continue to flood after heavy rain events and rain events would continue to damage the existing roads.	Minor fill is needed at Calestown Road, Green Bay Road, and Mitchumtown Road. Minimization measures and avoidance were used to reduce impacts. BMPs would prevent unpermitted construction impacts to wetlands.
Wildlife	No changes	Traffic speed limits would not be increased with the associated paving, therefore there would be no increase in the likelihood of wildlife being hit by moving vehicles. To combat the likelihood that certain species would be affected, existing canopy along road would remain largely intact.
PETS Plant and Animal Species	No changes.	The Biological Evaluation determined that Alternative 2 may affect but is not likely to adversely affect red-cockaded woodpecker and is not likely to affect any other threatened or endangered species.
Management Indicator Species	No changes.	There would be minor indirect impacts to the RCW and possible minor indirect impacts to the Prairie warbler, Awned meadow beauty, Pine woods tree frog, Sweet pitcher plant, and Northern bobwhite quail.
Migratory Birds	No changes.	There would be minor indirect impacts to migratory bird species due to the removal of small areas of vegetation (shrub species and mature trees).

Description	Alternative 1 – No Action	Alternative 2 – Proposed Action
Aquatic Resources	No changes. Aquatic organism passage would continue to be limited at Mitchumtown Road with a small 24-inch pipe.	Culverts would be maintained or upgraded. An existing water crossing beneath Mitchumtown Road would be upgraded from small 24-inch pipe to a large 60-inch pipe with a natural bottom channel.
Visual Quality	No changes.	No changes.
Recreation	No changes.	There would be no measurable change to recreation opportunities since the area is currently accessible by existing roads.
Cultural Resources	No changes.	Following a cultural resources survey, it has been concluded that there are no listed or potentially eligible sites of National Register of Historic Places (NRHP) that would be affected within the Area of Potential Effect.
Economics	No changes.	Property owners in the area could experience an increase in value due to better accessibility. Berkeley County would likely have some reduction in maintenance costs.
Climate Change	No changes.	No changes.
Civil Rights	No changes.	No changes.

## **CHAPTER THREE – ENVIRONMENTAL CONSEQUENCES**

This section summarizes the physical, biological, social, and economic environments of the project area and the potential changes due to implementation of the alternatives. This chapter provides an analytical basis for the comparison of alternatives in the previous chapter.

### **3.1 Physical**

#### **3.1.1 Soils**

##### **Affected Environment**

Soils within the proposed stand boundaries have undergone intensive management in the past and have remained stable and productive. However, soil types found within the project boundaries have limitations that should be considered before ground disturbing activities take place. Soil compaction, rutting, displacement, and severe burning of surface organics are the key factors that affect soil productivity.

Wetlands commonly occur in many soil types that are found within the analysis area. Hydric soils are often associated with wet flats, bays, swamps and wetlands. The water table typically is close to the surface and soils having restricted drainage are common throughout the area (NRCS, 1980).

The existing soils will not cause any limitations for road construction. Soils along the roadway are compacted, rutted, and disturbed due to consistent use by motor vehicles.

Mapped soils along Green Bay Road consist of Chipley-Echaw, Goldsboro, Lenoir, Pantego, and Norfolk series (Figure 5). Soils on Mitchumtown Road include the Chipley-Echaw series complex, Lynchburg, Pantego, and Witherbee series (Figure 6). Soils within the Calestown Road corridor include the Bethera, Bonneau, Duplin, Lenoir, Wahee, and Goldsboro series (Figure 7). Soil units mapped in the study vicinity of the Spring Pond Road project include the Goldsboro and Wahee series (Figure 7).

Echaw loamy sand is very deep, moderately well drained with moderately rapid to rapid permeability. Its slopes are usually less than 2 percent. Its parent material, like Chipley sand, is mostly marine sediments. Lynchburg loamy fine sand is somewhat poorly drained with moderate permeability. Its slopes range from 0 to 5 percent. Pantego loam series soils are composed of very deep, very poorly drained, moderately permeable soils that formed in thick loamy sediments on the Southern Coastal Plain and Atlantic Coast Flatwoods. Its slopes are less than 2 percent. Witherbee fine sand consists of very deep, somewhat poorly drained soils produced in sandy marine sediments. Its slopes also are less than 2 percent. Wahee fine sandy loam consists of slopes ranging between 0 to 4 percent which are somewhat poorly drained deriving from clayey and loamy marine or fluviomarine sediments. Goldsboro loamy sand is a very deep class of soil that is moderately well drained with slopes of 0 to 2 percent. Its parent material includes mostly marine as well as fluviomarine deposits. Bethera loam consists of very deep, poorly drained, clayey soils that formed in marine or fluvial sediments. Its slopes range from 0 to 2 percent. Bonneau loamy sand is considered very deep, well drained soils that also formed from marine or fluvial sediments. Its slopes range from 0 to 12 percent. Duplin fine loamy sand is consists of moderately well drained, moderately slow permeable soils

that have formed within Coastal Plain sediments. Slopes range from 0 to 6 percent. Lenoir loam consists of somewhat poorly drained, slowly permeable soils that have slopes of 2 percent or less.

### **Direct, Indirect, and Cumulative Effects**

*Alternative 1* – There would be no changes to current conditions. Soil may be lost through runoff during major storm events. The shallow surface profile consists of compacted fill that has been used for many years as a roadbed.

*Alternative 2* – Soils will be stabilized through paving. The current compacted road fill does not permit the accumulation of soil litter or duff, therefore this will not be impacted. Drainage ditches adjacent to the roadways will be unpaved and vegetated. Road maintenance activities have periodic short-term impacts on soils especially associated with blading and shaping road shoulders, road patching/resurfacing, maintaining ditches, mowing, and cleaning culverts. To install the road pavement, soils would not be scraped down to mineral soils, eliminating the potential for nutrient loss from native materials. Soils would also be disturbed at the power utility pole relocation areas. A tractor with a mowing deck would be used to clear the new pole location and a derrick truck would be used to install the pole. The pole would be placed from the existing roadside. Pole installation would not require soils to be removed.

Cumulative impacts to soils within the region have occurred with past road construction and widening projects. Construction outside of existing dirt roads may extend into native soil materials. Routine maintenance activities may include blading and removing accumulated sediment. Forest thinning, fireline construction, and harvest operations disturb soils with skidding, temporary roads, and landings. Activities that are reasonably foreseeable would be implemented under the standards for protecting soils listed in the Revised Land and Resource Management Plan for the FMNF; therefore, cumulative effects from these actions are minimal.

### **3.1.2 Air Quality**

#### **Affected Environment**

The National Ambient Air Quality Standards (NAAQS), set by authority of the Federal Clean Air Act establish Class I, II and III areas where harmful emissions are to be restricted. The restrictions cover six "criteria" airborne pollutants: lead, sulfur dioxide, carbon monoxide, nitrogen oxides, ozone and particulate matter. The most severe emission restrictions occur in Class I areas and are progressively more lenient in Class II and III areas. Much of the forest is designated as a Class II area that currently meets air quality standards for the Clean Air Act (Francis Marion National Forest Monitoring Report, FY 2003, pages 13-15). The only Class I area in South Carolina is the Cape Romaine National Wildlife Refuge, located south of the FMNF.

## **Direct, Indirect, and Cumulative Effects**

*Alternative 1* – No changes in the air quality would occur since no activities would be conducted that have the potential to generate or increase emissions or smoke. Existing air quality conditions and patterns would continue, including the movement of fugitive dust from the unpaved roads.

*Alternative 2* – Paving the roadway would reduce dust particles in the air, which would improve local air quality. Existing traffic flow and volumes are not predicted to increase due to paving segments of the roadway. Temporary impacts to air quality could occur with the use of heavy construction equipment, as they generate emissions. Cumulative actions such as increased local traffic and periodic prescribed burning can impact air quality. Burning takes place annually on the FMNF and has ranged from 30,930 to 40,694 acres per year in the last five-year period based on annual monitoring reports. The minor temporary impacts from this proposal will not contribute cumulatively to air quality.

### **3.1.3 Wetlands, Floodplains, and Water**

#### **Affected Environment**

The project corridors occur in the Wadboo Swamp (03050201-02), East Branch Cooper River (HUC 03050201-04), and Santee River (HUC 03050112-03) watersheds of the larger Santee River Basin (HUC 0305). Refer to Figure 8 for a map of these watersheds.

One way that South Carolina classifies surface waters of the state is based on their intended best uses. Surface water classifications for waters within the study area are designated Class “FW” waters, indicating they are freshwaters suitable for secondary contact recreation and as a source for drinking water supply after conventional treatment, accordance with the requirements of SCDHEC. These waters are suitable for fishing, and the survival and propagation of a balanced indigenous aquatic community of flora and fauna. Class FW waters are also suitable for industrial and agricultural uses.

The FMNF normally receives about 45-50 inches of rainfall each year. Summer average rainfall rates are typically higher than the rest of the state. The higher rainfall averages in June through September along the coast are partly due to the proximity to ocean moisture, hurricane and tropical storm events that tend to be more frequent and severe along the Atlantic and Gulf coasts. Periods of intense summer precipitation combined with poorly drained soils can create periods of saturation and ponding on some sites. Dormant season periods with high rainfall can create ponding and saturation, and under those circumstances, the hydric and poorly drained soils remain flooded, ponded or saturated for extended periods. Below average rainfall or periods of drought can reduce water in streams and wetlands.

Some of the roadway sections are currently adjacent to existing wetlands that are considered jurisdictional by the USACE. Within study area boundaries, no named streams were found to be present. Wetlands found within the Mitchumtown Road corridor are associated with Whitten Bay (east side) and Boggy

Swamp (west side). Whitten Bay drains into Mill Creek which flows into Wadboo Creek. Wadboo Creek intersects with the Cooper River approximately 2 miles east of Moncks Corner. Boggy Swamp is part of the Hell Hole Bay drainage which flows into Alligator Creek, a tributary of Gough Creek. Gough Creek flows into Huger Creek which flows into the East Branch of the Cooper River.

Wetlands along the south side of Green Bay Road are part of the Green Bay, a swamp which drains to Bennett Branch and then to Quinby Creek. Quinby Creek flows into the East Branch of the Cooper River near Huger, SC.

Wetlands within the Calestown Road corridor are associated with Savanna Creek, found east of the roadway. Savanna Creek flows north-northeast into the Santee River. There are no wetlands associated with Spring Pond Road (which is situated perpendicular to Calestown Road).

### **Direct, Indirect, and Cumulative Effects**

*Alternative 1* – Some soil would contribute to run-off from maintenance operations. Sediment with pollutants can negatively impact waters and wetlands. Use of other dirt roads within the FMNF would also contribute cumulatively to impact aquatic habitats. There would be no additional impacts to wetlands, floodplains, or water quality under this alternative. The FMNF through its LRMP and associated EIS would continue to mitigate impacts to wetlands and floodplains from their activities. There are currently no plans by Berkeley County to upgrade existing roads with the FMNF, outside of these 4 proposed locations.

*Alternative 2* – A total of 0.03 acres of wetlands would be filled and 0.01 acres would be cleared under this alternative. No hydrologic connections would be severed with improvements to the roadway. Existing ditches would be improved, rather than creating new connections throughout the forest. Ditches would not be blocked and should any temporary impacts occur, the ditches would be returned to normal function upon completion of project activities.

### **Calestown Road**

Approximately 0.040 acres of wetlands were identified within the proposed right-of-way of Calestown road during a jurisdictional determination, approved in June 2010. Road improvements will require approximately 0.0024 acres of fill and an additional 0.0046 acres of clearing for a total of 0.007 acres of impacts to wetlands. These roadway impacts are minimal and will not likely have an effect on the hydrology of wetlands identified within the corridor. The majority of impacts are associated with the replacement of a culvert that connects wetlands beneath the roadway.

### **Mitchumtown Road**

Approximately 0.123 acres of wetlands were identified within the proposed right-of-way of Mitchumtown road during a jurisdictional determination, approved in October 2010. Road improvements will require approximately 0.013 acres of fill and an additional 0.006 acres of temporary clearing for a total impact of 0.019

acres of total wetlands. These roadway impacts are minimal and will not likely have an effect on the hydrology of wetlands identified within the corridor. Approximately 23 linear feet of impacts are associated with the replacement of a culvert for a seasonal relatively permanent water (RPW) that connects existing wetlands. This existing 24-inch reinforced concrete pipe would be replaced with a larger 60-inch reinforced concrete pipe. This pipe would be countersunk to install a natural bottom to the channel with native soils. The upstream and downstream elevations would not be altered so that aquatic organisms can pass and move through the culvert. The extension of the culvert for the seasonal RPW will not likely have any effect on any of the wetlands identified as the hydrologic connection will remain in place.

### **Green Bay Road**

Approximately 0.060 acres of wetlands were identified within the proposed right-of-way of Green Bay Road during a jurisdictional determination, approved in June 2010. Road improvements will require approximately 0.017 acres of permanent fill. These roadway impacts are minimal and will not likely have an effect on the hydrology of wetlands identified within the corridor.

### **Spring Pond Road**

No wetlands were identified within the proposed right-of-way of Spring Pond road during the initial wetland delineations, performed in fall 2009. These wetland limits were approved in June 2010 and an extended project area was subsequently approved in July 2010. No wetlands will be impacted from this project and no wetland permits will be required for this segment.

Temporary increases in turbidity during reshaping of back slopes and ditches, especially after major storm events may occur. Banks along the road would be limited to relatively flat slopes. Disturbed soils will not be left uncovered or unstabilized. Permanent fill in jurisdictional freshwater wetlands would directly affect these wetlands. Section 404 of the Clean Water Act regulates much of the activities that occur in jurisdictional wetlands. Actions that damage the wetland character have been avoided, mitigated, or minimized to the maximum extent practicable.

Current and planned projects within the FMNF include prescribed burning, thinnings, and silvicultural treatments. These activities reduce fuel loadings and help promote understory plant diversity and keep forest ecosystems healthy and properly functioning. In addition, much of the land is in federal ownership which helps protect wetlands, floodplains, and water quality by limiting development.

Additional road work is also planned by the SCDOT and FHWA, such as the Steed Creek Road project. Road construction can temporarily and permanently impact wetlands and riparian areas. Land development, structural construction, and road work can impact wetlands and develop impermeable surfaces. These development activities would be permitted by the USACE and SC DHEC. Under the Clean Water Act, avoidance, minimization, and mitigation would be required to reduce impacts to wetlands. Access to road ditches with heavy equipment is periodically needed to maintain road conditions and safety. Some of these actions would temporarily expose or compact soils, producing a limited amount of erosion and sediment to ditches or roadways. These practices would be mitigated to limit effects and stabilize disturbance areas.

The National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the U.S. This can include ditches or

culverts. Approvals will be obtained through SC DHEC for coverage under the general permit for storm water discharges. BMPs such as sediment dams, slope stabilization, prompt reseeded of disturbed areas, and silt fencing would be used to minimize non-point and point source pollution and effects from sedimentation. Appropriate measures will be taken to avoid spilling construction materials and to control runoff from the project site. Such measures will include strictly enforcing the erosion and sedimentation control plan, provisions for waste materials and storage, stormwater management measures, and appropriate road maintenance measures. As minimum criteria, activities associated with this project will follow SC DHEC BMPs as outlined in *Best Management Practices for Construction and Nonpoint Source Management Program for the State of South Carolina*. SC DHEC BMPs will be strictly enforced during the construction stages of the project. Temporary impacts from any sediment that is not contained by the BMPs would be minor and short term.

### **3.1.4 Climate Change**

#### **Affected Environment**

On January 16, 2009 the Chief of the US Forest Service directed the National Forests to consider climate change during project planning. National forests were directed to consider the impacts that climate change would have on meeting goals and objectives stated in Forest Plans and the effects that the project contributes to climate change.

The US Global Changes Research Program published a 2009 report (USGCRP 2009) on climate changes on different regions. Predictions for the Southeast include: air temperature increases; sea level rise; changes in the timing, location and quantity of precipitation; and increased frequency of extreme weather events such as hurricanes, heat waves, droughts and floods. These predicted changes would affect renewable resources, aquatic and terrestrial ecosystems and agriculture, with implications for human health.

Human greenhouse gas (GHG) emissions, primarily carbon dioxide emissions (CO<sub>2</sub>), are the main source of accelerated climate change on a global scale. The Template for Assessing Climate Change Impacts and Management Options (TACCIMO) was used to assess conditions within the FMNF. TACCIMO (USFS 2011) was used to create a report that summarizes the resulting climate change impacts. Climate change, especially climate change variability (droughts and floods), may alter hydrologic characteristics of watersheds with implications for wildlife, forest productivity and human use. This climate change variability may result in long-term and seasonal changes in temperature that could influence ecosystem health and function. These impacts result from both long-term warming and from shorter term fluctuations in seasonal temperature that may interrupt or alter temperature dependent ecosystem processes.

The Santee River watershed is mostly forested and thus provides a source for uptake and storage of carbon. At the watershed scale, this uptake is substantial but at the larger global scale it is not measurable.

Generally speaking, a warmer and drier climate would reduce cold water fishing opportunities while warm weather activities may increase (TACCIMO, 2011). As reported by Morris and Walls (2009), climate change impacts could exacerbate current natural disturbances including drought, wildfire, insect infestations and extreme weather. “Changes in vegetation and other ecosystem components (e.g., freshwater availability and quality) caused by droughts, insects and disease outbreaks (Rouault et al., 2006), fires, and storms may alter the aesthetics, sense of place, and other cultural services that the public values.” Increased tree mortality sets the stage for increased wildfires which also affects outdoor recreation.

### **Direct, Indirect, and Cumulative Effects of Climate Change on the Roadway Projects**

*Alternatives 1 and 2* – Warmer summers predicted for the East will affect available soil moisture and affect net productivity. Minor long-scale changes in net productivity would not affect the four paved roads within the FMNF. Currently, there are no quantifiable methods to address changes that longer summers may have on traffic patterns.

### **Direct, Indirect, and Cumulative Effects of the Roadway Projects on Climate Change**

*Alternative 1* – The no action alternative would have no indirect, direct, or cumulative effects on climate change. The project traffic levels would not change and emissions caused by the project would remain constant.

*Alternative 2* – GHG emissions from a single project action are usually very small, (and often less than without the project). However, overall, users of the transportation system do contribute to GHG emissions. National estimates show that the transportation sector (including on-road vehicles, construction activities, airplanes, and boats) accounts for almost 30 percent of total domestic CO<sub>2</sub> emissions nationwide. Transportation GHG emissions are better addressed at the region, state, or transportation systems level where multiple projects can be analyzed in aggregate. In general, roadway project-level actions that can help reduce greenhouse gas emissions include reducing stop and go conditions, improving roadway speeds to a moderate level, and improving intersection traffic flow to reduce idling. The minor nature of this project will not largely affect traffic and therefore there will be little-to-no changes in GHG over the current levels. The contribution of vehicle use in the FMNF does factor into the overall GHG emissions of the region. Any local increases in traffic would contribute cumulatively with other changes in vehicle use. However, there will be no major changes in traffic patterns with the proposed action alternative. Past, present and reasonably future projects are not sensitive to climate change impacts because of their limited timeframe. Climate change impacts would occur over a much longer period.

### **3.1.5 Traffic Affected Environment**

The roads currently serve local residential traffic, as well as those visiting the FMNF. The USFS also uses the roads for access for management activities. Several single family homes are located adjacent to or near the roadways. There are no other developments in the study area that would facilitate or encourage traffic.

### **Direct, Indirect, and Cumulative Effects**

*Alternative 1* – Maintenance of the existing roads would not change under this alternative. Regular and routine maintenance would continue as needed, and as funding permitted. Due to the degraded state of the dirt roads, vehicles currently travel along the roadway edge, or onto the areas adjacent to the road. Minor and major storm events fill large potholes and depressions in the roadway that are typically avoided by vehicles.

*Alternative 2* – The type of maintenance activities will shift from those required for dirt roads, to those needed for paved roadways. Roadway ditches and culverts would be cleaned and maintained. Potholes would be filled as time and funds permitted. Traffic would travel safely along a two-lane roadway, eliminating the need to drive off of the road section into adjacent soils/shoulders. As there are no major indirect or direct impacts to traffic, there will be no contribution to cumulative traffic impacts.

## **3.2 Biological**

### **3.2.1 Vegetation**

#### **Affected Environment**

The majority of the vegetative communities in the project study area are dominated mixed stage pine and hardwood forests. The pine communities are representative of those typically found in the South Carolina coastal plain. These communities occur on a variety of soil types and landforms from poorly drained flatwoods to well drained sandy ridges. Pine canopies vary from open with numerous gaps to more closed canopies with little or no gaps between the dominant and co-dominant trees. Understories in the pine forests are predominantly grass/sedge/herb dominated with numerous shrub species. The species composition and diversity are dependent on several interacting factors such as fire frequency/intensity, overstory/midstory canopy density, soils/hydrology and past management practices. Bottomland and swamp hardwood forests are also present in the project area. Bottomland hardwoods typically contain species such as swamp chestnut oak (*Quercus michauxii*), cherrybark oak (*Quercus pagoda*), sweetgum (*Liquidambar styraciflua*), loblolly pine (*Pinus taeda*), red maple (*Acer rubrum*), willow oak (*Quercus phellos*), water oak (*Quercus nigra*), and laurel oak (*Quercus laurifolia*).

Reconnaissance level vegetation surveys were completed along each roadway section in March 2011. Adjacent to Spring Pond Road, ruderal species and residential landscaped grasses are present. This area is developed with single family residential houses and associated maintained vegetation.

At Calestown Road vegetation within the project area includes loblolly pine, red maple, water oak, crepe myrtle (*Morella cerifera*), fetterbush (*Lyonia lucida*), giant cane (*Arundinaria gigantea*), American holly (*Ilex opaca*), daisy fleabane (*Erigeron annuus*), black snakeroot (*Pterocaulon pycnostachyum*), wisteria (*Wisteria sinensis*), non native annual grasses, and ruderal species commonly found along roadsides.

Along Mitchumtown Road vegetation consists of water oak, red maple, dogwood (*Cornus florida*), *Pinus sp.*, sweetbay (*Magnolia virginiana*), American holly, crepe myrtle, giant cane, Christmas fern (*Polystichum acrostichoides*), goat's rue (*Tephrosia virginiana*), Spanish moss (*Tillandsia usneoides*), wisteria, wild strawberry (*Fragaria sp.*), non native annual grasses, and ruderal species commonly found along roadsides. Local residents have planted non native annual grasses to maintain their yards as well as other species such as pampas grass (*Cortaderia araucana*) and cultivated azaleas (*Rhododendron sp.*).

Vegetation at Green Bay Road includes water oak, red maple, dogwood, *Pinus sp.*, sweetbay, American holly, crepe myrtle, alder (*Alnus sp.*), pond cypress (*Taxodium ascendens*), black tupelo (*Nyssa sylvatica*), lizard's tail (*Saururus cernuus*), giant cane, fetterbush, Spanish moss, wisteria, wild strawberry, dandelion (*Taraxacum sp.*), non native annual grasses, and ruderal species commonly found along roadsides. Local residents have planted non native annual grasses to maintain their yards as well as other species such as pampas grass and cultivated azaleas.

### **Direct, Indirect, and Cumulative Effects**

*Alternative 1* – There would be no impacts to vegetation under this alternative.

*Alternative 2* – Direct impacts to vegetation would include clearing to accommodate road construction. Removal of some early pine trees is required in spot locations to construct the two-lane road section. Clearing and grubbing of vegetation can also have beneficial impact. This creates an early successional zone where young plants can become established and provide habitat for the animals and insects that would utilize an early stage vegetative plot. To prevent the growth of ruderal, volunteer species a native herbaceous mix would be used to stabilize soils and revegetate the area.

Road construction can encourage the establishment of invasive species in disturbed areas. To prevent unwanted species, seeding and planting along the roadside would consist of native and non-invasive species. Priority will be placed on using local and regional seed sources to include native perennial roadside plants. Heavy construction equipment can transport and deposit seeds, including exotic and invasive species. Fill material used to supplement the roadway can also contain undesirable seed stock. Equipment for this project would be required to be clean and free of debris and non-native material. Should fill be necessary for construction, clean fill would be used. There is no herbicide use proposed for the construction of these projects.

Direct impacts to vegetation would also occur through clearing for utility pole relocation. Trees would be cut to ground level in the immediate area of the pole and adjacent trees would be side trimmed to accommodate utilities. Removed vegetation would be mulched and placed on-site. There would be minimal loss of trees in

riparian areas (at stream road crossings). Trees would be cut only if needed to install power poles/ maintenance of the utility ROW or if they would interfere with road widening or culvert installation activities. As the pole locations are close to the existing roadway, trees can be removed by utilizing the existing roadbed, rather than clearing a path to access trees. There would be no skidding activities to remove large trees. The cleared area at the utility poles would need to remain clear for safety and access purposes. Currently, BEC maintains and clears these locations every five to seven years.

There are cumulative impacts to vegetation through activities such as prescribed burning, building construction, road construction, and trail maintenance. Periodic burning and vegetative thinning throughout the FMNF would not be impacted by this alternative. All impacts associated with the road paving projects will be minimized to the maximum extent possible to prevent adverse cumulative impacts to vegetative communities throughout the region.

### **3.2.2 Potential, Endangered, Threatened, and Sensitive Species (PETS)**

#### **Affected Environment**

The FMNF provides habitat for 11 federally threatened and endangered species and 25 species designated as “sensitive” by the Regional Forester for Region 8, USFS. PETS are detailed in the Biological Evaluation in the attached Appendix. Based on survey results, habitat being impacted, and State heritage records, RCW, Bachman’s sparrow, pineland plantain, and pineland dropseed are the only PETS species which were considered to be potentially impacted by this project

The PETS species determined to occur within the project study area include active RCW clusters within ½ mile of proposed project activities along Green Bay Road (Figure 9). Based on GIS data last updated in 2012, the project area at Green Bay Road occurs within the ½ mile foraging partition of an RCW cluster known as 103C and near 2 other RCW clusters. The project corridors along Mitchumtown Road, Calestown Road, and Spring Pond Road are not within the half-mile foraging partitions of the RCW. The FMNF is home to the third largest federally endangered RCW population and is one of the 13 designated core recovery populations (RCW Recovery Plan, 2003). Hurricane Hugo of 1989 destroyed a large number of cavity trees and foraging habitat for the RCW within the FMNF. The RCW population has decreased and increased over time and was considered recovered from the effects of Hurricane Hugo by the RCW Recovery Plan (2003). Artificial cavities and management of prescribed burning helped to support the population.

#### **Direct, Indirect, and Cumulative Effects**

*Alternative 1* – There would be no impacts to PETS species under this alternative.

*Alternative 2* – There will be no direct effects to PETS species, including the RCW. No cavity trees would be removed under this alternative. Clusters that are currently near roadways have acclimated to the minor

levels of traffic noise and would not be impacted. Extended periods of disturbance caused by heavy machinery could have negative impact on breeding productivity of active clusters. Mechanical activities would not be conducted within 200 feet of RCW cavity trees during the RCW breeding season (April 1st – July 31st) to reduce the potential impact of disturbance on nesting activities. Mechanical activities within RCW clusters would only take place between one hour after sunrise and one hour before sunset. Although no cavity trees would be removed, two dozen pine trees with a diameter at breast height of less than 8 inches would be removed to accommodate the two-lane Green Bay Road. This slight decrease in foraging stems is not likely to negatively impact breeding productivity.

Indirect effects were considered for species associated with upland pine woodland habitat and wet pine/pond cypress savannas. Habitat occurring immediately adjacent to the roadway would be impacted. This reduction in habitat is negligible when compared to the known total acreage of potential PETS habitat known from the FMNF. The quality of the habitat adjacent to the roadway is diminished due to disturbances associated with vehicle use.

Although neither pineland plantain nor pineland/Carolina dropseed have been documented in the project areas, if they were to occur there, directly effects to individual plants could occur in association with clearing and road maintenance, and include the uprooting, crushing, or displacement of individuals. These direct effects are unlikely though, since the species is not likely to occur there due to the lack of known occurrences. For Bachman's sparrow, possible direct effects of the project could include the destruction of or damage to nests and nestlings if treatments occur during nesting season. There will be minimal removal of mature vegetation and impacts are expected to be minor.

### **3.2.3 Management Indicator Species (MIS)**

#### **Affected Environment**

A wide variety of wildlife species are found throughout the FMNF. The forest represents one of the largest and most biodiverse forested landscapes in South Carolina. In order to complete the analysis of potential impacts to wildlife regarding issues and concerns from the Proposed Action and its alternatives, Management Indicator Species (MIS) are used to represent the diversity of habitats. Long-term changes in the populations of these species serve as a barometer of the overall health of ecosystems. Population information for wildlife species is usually collected at the forest level rather than and level inventories. These estimates are related to the habitats occurring in the area. Seven MIS were identified as potentially occurring in the project area and vicinity thereof (Table 2). All of these MIS have been documented within the analysis area. Detailed discussions of these species can be found in the Management Indicator Species Population and Habitat Trends, Francis Marion and Sumter National Forests (USDA 2001), which is available upon request.

**Table 2. MIS and Probable Occurrence in the Project Study Area.**

MIS Species	Habitat Altered or Created	Direct/ Indirect Effects	General Comments
American swallow-tailed kite ( <i>Elanoides forficatus</i> )	Yes	No/No	A tree top nester in predominantly forested landscapes typically with open canopy characteristics; most common in floodplain forests and other large tracts of forested wetlands/mixed pine habitats of the outer coastal plain; State listed as endangered; migratory.
Red-cockaded woodpecker ( <i>Picoides borealis</i> )	Yes	No/Yes	A bird of the open pine woodlands and savannas of the coastal plain and sandhills; uses park-like mature pine woodlands and savannas with little mid-story and few broad-leaved hardwoods for nesting; federally listed as endangered; non-migratory.
Prairie warbler ( <i>Dendroica discolor</i> )	Yes	No/ Possible	Frequents brushy old fields and open pine stands; population is common but declining; frequently host to cowbird parasitism; vulnerable to habitat loss that occurs with canopy closure of forests; neotropical migrant.
Awmed meadow beauty ( <i>Rhexia aristosa</i> )	Yes	No/ No	A species of the pond margins and moist soils of the savannas of the coastal plains; more common in habitats with few woody species that are frequently burned.
Pine woods tree frog ( <i>Hyla femoralis</i> )	Yes	No/ Possible	Most common near bogs or swampy areas in pine flatwoods and savannas in the coastal plain; also found in hardwood forests and swamps.
Sweet pitcher plant ( <i>Sarracenia rubra</i> )	Yes	No/ Possible	A carnivorous perennial plant of the bogs and moist soil margins of pocosins, bays and cypress – tupelo ponds of the coastal plain.
Northern bobwhite quail ( <i>Colinus virginianus</i> )	Yes	No/ Possible	Favors fields, grasslands, brushy habitats and open woodland; significantly declining over most of its range due to habitat loss and changes in farming practices; non-migratory.

### Direct, Indirect, and Cumulative Effects

*Alternative 1* – There would be no direct effects to any of the MIS under this alternative as construction activities would not occur. Creation of habitat for species that require early successional/open habitat conditions, such as the prairie warbler, would be a random occurrence under this alternative. Any incidental habitat created via natural events would be of marginal quality limited distribution. Habitat for species of seasonally flooded isolated wetlands and savannas (awmed meadow beauty, pine woods tree frog, and sweet pitcher plant) would remain unchanged.

Habitat for the American swallow-tailed kite and RCW would essentially remain unchanged. Foraging and potential nesting habitat for the RCW would be enhanced under the no action alternative.

Typical ongoing activities in the analysis area include wildlife habitat improvement and maintenance, timber harvesting, prescribed burning, and trail construction/maintenance. Habitats for MIS of early-successional and open pine woodland/savanna species are being marginally maintained by prescribed burning and are generally decreasing across the Francis Marion National Forest. This alternative would not contribute towards enhancement or maintenance of habitat for species such as the RCW, prairie warbler and northern bobwhite quail.

Forestwide trends for MIS that have been summarized in Management Indicator Species Population and Habitat Trends – Francis Marion & Sumter National Forest (2001), Annual Monitoring Reports (2002-2009), and Fauth (2003) suggest that populations for pine woods tree frog, awned meadow beauty, and sweet pitcher plant are stable on the Forest. Sweet pitcher plant is known to occur along the southern boundary of compartment 195 stand 2. Field observations made during 2010 indicate that prescribed burns alone are not maintaining desirable habitat for the plant at this location. Generally, localized declines in populations for awned meadow beauty and sweet pitcher plant have been observed on the FMNF where frequent prescribed fire is lacking. The cumulative effects of no action on MIS species found on the edges of ephemeral ponds would be a decline in the absence of fire proposed in this project.

Habitat for species of the forest canopy (i.e., American swallow-tailed kite) would essentially remain unchanged in the study area under this alternative.

*Alternative 2* – Direct temporary effects include immediate consequences of vegetation removal for utility pole relocations and road construction activities, which could result in the crushing or harming of individuals within the project area. Indirect effects include the consequences of activities that result in the modifications of habitat and ecological conditions that affect food, water, cover and other life requirements for a species.

No direct effects to the avian MIS are expected because these species would leave temporarily once disturbances begin. Vegetation removal would occur outside of the nesting bird season.

In general, habitat diversity is not expected to change significantly under the build alternative. Vegetation would be removed in small linear strips adjacent to the existing roadway and at utility pole locations. This would not result in the complete loss or significant take of any habitat type. In spot areas where additional fill is needed to support the roadbed, vegetation would be permanently removed. This eliminates the chance for future colonization by any plant species and may indirectly affect MIS species. Impacts to freshwater wetlands consist of minor fill, however this fill would not eliminate the functions and values of the wetlands.

In the short term, the proposed action does have the potential to indirectly affect the RCW by the taking of potential foraging-sized pine trees. However, this reduction is not expected to adversely affect the RCW,

nor is it expected to inhibit the establishment of new clusters through natural attrition (i.e., pioneering or budding). Implementation of mitigation measures would minimize direct and indirect effects of Alternative 2 to all MIS species within the study areas.

This cumulative effects analysis tiers to the Forest-wide MIS document dated August, 2001 which provides context for species and their habitats across the Francis Marion. This alternative would indirectly affect the RCW by removing several foraging-sized trees. Other actions in the past have also contributed to removing foraging trees. Habitat for the RCW rapidly disappeared on the FMNF after Hurricane Hugo and continues to be in short supply across the forest. In addition to activities planned in this alternative, other projects are being implemented and/or planned on the Francis Marion. Those projects include thinning treatments on thousands of acres over the next five years, prescribed burning of 30-40,000 acres/year, refurbishing dozer fire lines, non-native invasive species control treatments, mastication of the midstory within RCW partitions, and trail construction/reconstruction and maintenance.

Private lands in the area are predominantly forested, mostly under management. There are some areas of tidal influence salt marsh and wetlands, and some urban development in the area, which is continually expanding. Private lands are managed primarily for purposes other than maintaining wildlife habitat and may or may not consistently provide quality habitat conditions.

In general, the proposed action would have minor indirect effects on MIS species and would contribute cumulatively to species impacts. The small acreage of vegetation removal and wetlands impacts would not cause a major impact to any MIS species.

### **3.2.4 Migratory Birds**

#### **Affected Environment**

The road projects fall within Bird Conservation Region (BCR) 27 – Southeastern Coastal Plain. Several sources were reviewed to identify priority migratory birds that are likely to be found in and around this project (e.g., Partners in Flight (PIF) published list of priority species and habitats for BCR 27, USFWS published list of Birds of Conservation Concern 2008, the South Carolina Breeding Bird Atlas, and “Status and Distribution of South Carolina Birds” written by Post and Gauthreaux). The results of this review produced the following table of bird species of priority management concern. Species indicated in Table 3 were selected for analysis based on documented or known occurrences within or adjacent to the project study area. Some species were also selected based on known occurrences within the analysis area and likelihood of high quality habitat being affected or created. Effects to the swallow-tailed kite, prairie warbler, RCW, Northern bobwhite quail, and Bachman’s sparrow have already been addressed in the MIS and PETS sections of this EA and the attached biological assessment. As such, they are not thoroughly discussed in this section.

**Table 3. Priority Migratory Birds for the Francis Marion National Forest.**

<b>Species</b>	<b>Habitat Altered or Created</b>	<b>Habitat</b>	<b>Direct Effect Y/N</b>	<b>Indirect Effect Y/N</b>
Swallow-tailed kite	Yes	Mature hardwood, forested wetlands, pine/hardwood mix	N	N
American kestrel	Yes	Open, mature pine	Y	Y
Brown-headed nuthatch	Yes	Open, mature pine	Y	Y
Wood thrush	No	Mature hardwood, pine/hardwood mix	N	N
Black-throated green warbler (Wayne's ssp.)	No	Mature hardwood, forested wetlands	N	N
Prairie warbler	Yes	Scrub-shrub, early succession, or maritime forest	Y	Y
Swainson's warbler	No	Dense understory in mature hardwood, forested wetlands, pine/hardwood mix	N	N
Painted bunting	No	Scrub-shrub, early succession, or maritime forest	N	N
Red-cockaded woodpecker	Yes	Open, mature pine	N	Y
Bachman's sparrow	Yes	Open pine, grassland scrub/shrub	Y	Y
Migrant loggerhead shrike	Possible	Open pine, grassland scrub/shrub	N	N
Hooded Warbler	No	Bottomland and upland hardwood forests	N	N
Northern parula	No	Bottomland and upland	N	N

		hardwood forests		
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The Forest Service, along with multiple partners, has been monitoring bird populations on the Francis Marion National Forest for decades. Approximately 250 different species of birds have been documented on the FMNF. Due to its significance to resident and migratory birds, the Francis Marion National Forest has been designated as an Important Bird Area by both the National Audubon Society and the American Bird Conservancy. Important Bird Areas are defined as sites that have been documented to support significant populations of particular species or a significant diversity of species. The FMNF provides essential stopover habitat for autumn and spring migrating birds, as well as critical breeding habitat. Three species known to occur on the Francis Marion and listed on the National Audubon’s red list include the Red-cockaded Woodpecker (RCW), Swainson's Warbler (*Limnothlypis swainsonii*) and Bachman's Sparrow (*Aimophila aestivalis*). Approximately 12 species of migratory birds listed on the National Audubon’s yellow list have been documented on the forest. Due to the diversity of habitats found adjacent to the project study area, species with high conservation priority such as the Black-throated Green Warbler (*Dendroica virens*), Swainson’s Warbler (*Limnothlypis swainsonii*), Prothonotary Warbler (*Protonotaria citrea*), Brown-headed Nuthatch (*Sitta pusilla*), RCW, Chuck-would’s Widow (*Caprimulgus carolinensis*), Yellow-throated Warbler (*Dendroica dominica*), and Northern Parula (*Parula Americana*) are likely to occur there. Wetlands adjacent to the analysis area are used by multiple other priority species, including: Little Blue Heron, American Woodcock and Swallow-tailed Kite (*Elanoides forficatus*) for foraging, roosting and nesting.

**Direct, Indirect, and Cumulative Effects**

*Alternative 1* – There would be no effects to any bird species under this alternative as construction activities would not occur.

*Alternative 2* – While there is always the potential to injure or lose individuals when roosting, foraging, or nesting habitat is impacted, direct effects on populations of any migratory bird species from the proposed actions would likely be imperceptible. As previously mentioned, the FMNF has been monitoring bird populations on the forest for decades. This annual monitoring is conducted to assess avian presence/absence and frequency of occurrence by habitat conditions. As long as monitoring efforts continue, the FMNF would be able assess avian trends on the forest after construction is completed. The removal of a small number of mature trees adjacent to the roadway could temporarily disturb and, to some degree, displace migratory birds that are present at the time. It is possible that individual nests and nestlings of avian species could be lost due to these activities. However, this potential effect may be temporal for the following reasons: construction may or may not occur while nests are active, tree removal will be of short duration in any given location if active nests are present, and many avian species raise multiple broods or are known to re-nest if disturbed during the nesting season. Consequently, no measurable decline in reproductive success of migratory birds is expected result from any of the proposed

activities. Impacts to adult birds are not expected, as adults would likely disperse from the area of disturbance and readily re-nest.

If any direct or indirect impacts occur to bird species, this would contribute to overall cumulative impacts in the assessment area. Land and vegetation management activities take place throughout the FMNF. These impacts are assessed separately by the USFS and would ensure that potential cumulative effects to migratory species would not jeopardize their habitat or continued existence. Activities on private residential tracts could impact migratory species, but given the relatively small acreage of private lands within the impact assessment area, these cumulative contributions would be minor.

In general, the proposed action would have minor indirect effects on migratory bird species and could have direct impacts on individuals if mature tree removal occurs during nesting periods at an active nest site. The small acreage of vegetation removal and wetlands impacts would not cause a major impact to any migratory bird species.

### 3.2.5 Aquatic Resources

#### Affected Environment

The project study areas are located across several Forest watersheds. Forest watersheds contain warm water aquatic communities that include fish and macroinvertebrates. The warm water aquatic community serves as a management indicator that is monitored to indicate the effects of management on riparian resources. Fish, crayfish, aquatic insects and mollusks are all components of the community. The following Table 4 lists aquatic species captured by backpack electrofishing on streams in the Francis Marion National Forest. A total of 34 different streams were sampled in 2002-2004, 2006 and 2010. Thirty-two of these streams were sampled in 1993.

**Table 4. Aquatic species captured in streams in the Francis Marion National Forest.**

Species		1993	2002	2003	2004	2006	2010
	# Watersheds	9	6	9	1	10	10
	# Streams	17	9	15	2	18	29
<b>Amblyopsidae</b>							
<i>Chologaster cornuta</i>	swampfish		x			x	x
<b>Amiidae</b>							
<i>Amia calva</i>	bowfin			x			x
<b>Anguillidae</b>							
<i>Anguilla rostrata</i>	American eel	x	x	x	x	x	x
<b>Aphredoderidae</b>							
<i>Aphredoderus sayanus</i>	pirate perch	x	x	x		x	x
<b>Atherinidae</b>							
<i>Labidesthes sicculus</i>	brook silverside	x					
<b>Catostomidae</b>							

Species		1993	2002	2003	2004	2006	2010
<i>Erimyzon oblongus</i>	creek chubsucker	x	x	x		x	x
<b>Centrarchidae</b>							
<i>Acantharchus pomotis</i>	mud sunfish	x	x	x	x	x	x
<i>Centrarchus macropterus</i>	flier	x	x	x		x	x
<i>Enneacanthus gloriosus</i>	bluespotted sunfish	x	x	x			
<i>Enneacanthus obesus</i>	banded sunfish	x		x		x	x
<i>Lepomis auritus</i>	redbreast sunfish	x				x	x
<i>Lepomis gibbosus</i>	pumpkinseed			x		x	
<i>Lepomis gulosus</i>	warmouth	x	x	x		x	x
<i>Lepomis macrochirus</i>	bluegill	x	x	x			
<i>Lepomis marginatus</i>	dollar sunfish	x	x	x			x
<i>Lepomis punctatus</i>	spotted sunfish	x		x		x	x
<i>Micropterus salmoides</i>	largemouth bass	x				x	x
<b>Cyprinidae</b>							
<i>Hybognathus regius</i>	Eastern silvery minnow					x	
<i>Luxilus cornutus</i>	common shiner	x					
<i>Notemigonus crysoleucas</i>	golden shiner	x	x	x	x	x	x
<i>Notropis chalybaeus</i>	ironcolor shiner	x					
<i>Notropis cummingsae</i>	dusky shiner	x					
<i>Notropis petersoni</i>	coastal shiner	x	x			x	x
<b>Esocidae</b>							
<i>Esox americanus</i>	redfin pickerel	x	x	x	x	x	x
<i>Esox niger</i>	chain pickerel	x				x	x
<b>Elassomatidae</b>							
<i>Elassoma evergladei</i>	Everglades pygmy sunfish					x	x
<i>Elassoma zonatum</i>	banded pygmy sunfish	x	x	x		x	x
<b>Fundulidae</b>							
<i>Fundulus chrysotus</i>	golden topminnow			x	x		
<i>Fundulus diaphanus</i>	banded killifish					x	x
<i>Fundulus lineolatus</i>	lined topminnow	x					
<b>Ictaluridae</b>							
<i>Ameiurus natalis</i>	yellow bullhead	x	x	x		x	x
<i>Ameiurus nebulosus</i>	brown bullhead	x		x			
<i>Noturus gyrinus</i>	tadpole madtom	x		x		x	
<b>Percidae</b>							
<i>Etheostoma fusiforme</i>	Swamp darter	x	x				
<i>Etheostoma serrifer</i>	sawcheek darter					x	x
<b>Poeciliidae</b>							
<i>Gambusia holbrooki</i>	Eastern mosquitofish	x	x	x	x	x	x
<i>Heterandria formosa</i>	least killifish		x				x
<b>Soleidae</b>							
<i>Trinectes maculatus</i>	hogchoker		x				
<b>Umbridae</b>							
<i>Umbra pygmaea</i>	Eastern mudminnow	x	x	x	x		x

The American eel and ironcolor shiner are ranked as G4 by NatureServe (2010). This ranking indicates that the species is uncommon, but not rare and that there is some cause for long term concern due to declines or other factors. All other fish species sampled in the watershed are ranked as G5 which indicates that the species is common, widespread and abundant. The conservation status of the ironcolor shiner was designated as vulnerable by the American Fisheries Society (Warren, et. al. 2000). The vulnerable designation indicates that a species may become endangered or threatened by relatively minor disturbances to its habitat or that it deserves careful monitoring of its distribution and abundance. All other fish species sampled in the watershed were designated as currently stable by the American Fisheries Society (AFS). This indicates that a species is currently stable and its distribution is widespread and stable or that a species may have declined in portions of its range but is not in need of immediate conservation management actions. AFS conservation status includes CS (currently stable), V (vulnerable), T (threatened) and E (endangered).

The SC Comprehensive Wildlife Conservation Strategy (Kohlsaet et. al. 2005) includes the South Carolina Department of Natural Resources Priority Species List. These species warrant conservation concern to maintain diversity in South Carolina waters. The species are ranked in priority as moderate, high and highest. The American eel is ranked as highest priority. The banded killifish and mud sunfish are rated as moderate priority.

In addition, there are several species known to occur in larger streams and rivers. These include federally listed species such as the shortnose sturgeon and the Atlantic sturgeon.

Macroinvertebrate population conditions are unknown. No aquatic insects have been collected. Crayfish were collected in conjunction with the fish community monitoring in 2003. Four species of crayfish were collected during fish community surveys and identified by Eversole (unpublished data 2004). Additional species sampled in a Forest wide inventory (Eversole and Jones 2011) include the digger crayfish, White River crawfish and the black mottled crayfish. AFS conservation status of crayfish is from Taylor et. al. 2007. CS denotes that the population is currently stable. Crayfish collected in 2003 and 2011 are detailed in Table 5 below.

**Table 5. Crayfish species collected in 2003 and 2011.**

Species		Nature Serve Rank	AFS Conservation Status
<i>Fallicambarus fodiens</i>	Digger crayfish	G5	CS
<i>Procambarus acutus</i>	White River crawfish	G5	CS
<i>Procambarus ancylus</i>	Coastal Plain crayfish	G4, G5	CS
<i>Procambarus enoplosternum</i>	Black mottled crayfish	G4, G5	CS
<i>Procambarus lepidodactylus (?)</i>	Pee Dee lotic crayfish	G4	CS
<i>Procambarus chacei</i>	Cedar Creek crayfish	G4	CS

Species		Nature Serve Rank	AFS Conservation Status
<i>Procambarus troglodytes</i>	Eastern red swamp crayfish	G5	CS

The SC Comprehensive Wildlife Conservation Strategy ranks the Pee Dee lotic crayfish as high priority; and the Coastal Plain crayfish, Black mottled crayfish and Cedar Creek crayfish as moderate.

A preliminary list of mollusk species from a draft report are listed in Table 6. A mollusk inventory of the Forest was conducted in 2011 by The Catena Group, Inc. The following species are listed in the draft inventory report. AFS conservation status of mussels is from Williams et. al. 1992. CS denotes a species whose distribution and abundance may be stable, or it may have declined in portions of its range but is not in need of immediate conservation management actions. SC denotes a species that may become endangered or threatened by relatively minor disturbances to its habitat, and deserves careful monitoring of its abundance and distribution.

**Table 6. Mollusk species collected in 2011.**

Species		Nature Serve Rank	AFS Conservation Status
Mussels			
<i>Elliptio angustata</i>	Carolina lance	G4	SC
<i>Elliptio complanata</i>	Eastern elliptio	G5	CS
<i>Elliptio icterina</i>	Variable spike	G5Q	CS
<i>Unio merus carolinianus</i>	Florida pondhorn	G4	CS
Snails and Clams			
<i>Amnicola sp.</i>	a freshwater snail		
<i>Campeloma limum</i>	File campeloma	G5	
<i>Physa pomilia</i>	Glossy physa	G5	
<i>Planorbella trivolvis</i>	Marsh Ram's Horn	G5	
<i>Sphaeriidae</i>	a freshwater Clam		
<i>Viviparus intertextus</i>	Round Mystery Snail	G4	

The SC Comprehensive Wildlife Conservation Strategy ranks the Carolina lance, Eastern elliptio and Variable spike as moderate priority.

Forest coastal streams are characterized by pool and glide habitat types with primarily sandy substrates. Habitat diversity is mostly provided by tree roots and aquatic vegetation. During recent surveys, it has been observed that large woody debris is lacking in the coastal stream systems. Hansbarger and Dean (1994) stated that fish inventory was difficult due to the abundance of downed trees and wood in the streams after Hurricane Hugo.

### **Direct, Indirect, and Cumulative Effects**

*Alternative 1* – There are no federally listed or forest sensitive aquatic species in the project area. There would be no direct or indirect impacts to the aquatic community under the no action alternative. The aquatic community would remain in the present state or continue any current population trends.

*Alternative 2* – The degree of impact on the aquatic community depends on the extent and duration of riparian disturbance and the time period it takes for site rehabilitation. Revegetation of disturbed soils and installation of erosion control methods would be implemented to minimize these impacts. Forest Standards and Guidelines associated with riparian areas and streams and the following mitigation measures would be implemented to minimize impacts from proposed activities:

- Grading and ditching would be accomplished in a manner that would prevent sediment runoff into area waters. Erosion control measures such as silt fences, diversions, and temporary rock sediment dams would be installed to trap sediment in areas where runoff water has the potential to leave the project site. Erosion control devices would be maintained in working order throughout project activities and until plant growth is established and stable enough to control runoff and erosion.
- Stream crossing designs should incorporate culverts which are fish passable. When possible, open bottom arch culverts equal in size to the bank full width of the stream should be installed. Culverts should be installed to mimic natural stream functions to allow the transport of wood and sediment and sized to prevent erosion and head cutting. Stream excavation would be restricted to the immediate vicinity of the culvert installation. No wet concrete would come in contact with stream water when installing stream crossings.

There are no federally listed or forest sensitive aquatic species in the project area. This project is unlikely to have indirect impacts from sediment on the aquatic community with the implementation of Forest Plan Standards and Guidelines, SC Best Management Practices and the above mitigation measures. Direct impacts may occur to individuals of the aquatic community from stream culvert replacement, but there should be no risk to aquatic population viability across the forest.

A total of 0.03 acres of wetlands would be filled and 0.01 acres would be cleared under this alternative. No hydrologic connections would be severed with improvements to the roadway. Existing ditches would be improved, rather than creating new connections throughout the forest. Beneath Mitchumtown Road there is an existing 24-inch reinforced concrete pipe that would be replaced with a larger 60-inch reinforced concrete

pipe. This pipe would be countersunk to install a natural bottom to the channel with native soils. The upstream and downstream elevations would not be altered so that aquatic organisms can pass through the culvert.

Ditches would not be blocked and should any temporary impacts occur, the ditches would be returned to normal function upon completion of project activities. There would be no major impacts to nearby jurisdictional wetlands. BMPs would be used during construction to minimize temporary impacts.

Roadway drainage would be contained with adjacent vegetated ditches. There would be minimal loss of trees in riparian areas (at stream road crossings). Trees would be cut only if needed to install power poles/ maintenance of the utility ROW or if they would interfere with road widening or culvert installation activities. There is no herbicide use proposed for the construction of these projects.

### **3.3 Social**

#### **3.3.1 Visual Environment**

##### **Affected Environment**

The forest is located on the coastal plain of South Carolina. The area has a mixed ownership of residential, light agriculture/commercial, and National Forest lands. Most of the roads in the forest are moderate use rural roads with mostly local traffic. Highways 17, 17-A, 45, and 41 are the primary roads traveled by many local residents and tourists. Forest Service roads also provide access to stands in the proposed action area. Scenery is dominated by forested lands and occasional inclusions of private lands.

The majority of the Forest is not visible from major travel ways. The Forest is generally flat and the sight distances are often obscured by vegetation. Some areas have been regenerated or have been burned on a frequent basis offer some views into the forest. Very few vista or overlooks exist and private lands often are the only break in vegetative patterns.

##### **Direct, Indirect, and Cumulative Effects**

*Alternative 1* – There would be no impacts to visual resources under this alternative. No changes along the roadways would take place.

*Alternative 2* – There would be no substantial impacts to visual resources under Alternative Two. The existing roads would be paved to accommodate two lanes of vehicular traffic. While the treatment along the road would change from compacted dirt to asphalt, no community views or scenic views would be affected. Minor power utility pole relocations would result in no significant changes in the number or appearance of the poles. With no major indirect or direct impacts, there are no expected cumulative impacts to visual resources in the region.

### 3.3.2 Recreation

#### Affected Environment

These four roads provide access through the FMNF, ultimately linking travelers to other roads and trails within the Forest. Typical recreational activities include hunting, fishing, hiking, bicycling, bird watching, wildflower/plant viewing, and scenic driving. The demand has increased for horseback riding, mountain biking, and water-related activities. Hunting on the Forest continues to be popular. However, there is a shift toward hunting big game rather than small game. The demand for fishing is increasing faster than the demand for hunting.

#### Direct, Indirect, and Cumulative Effects

*Alternative 1* – The current conditions would continue. Bicyclists and pedestrians must utilize the narrow, unpaved roadway for access. This poses a higher safety risk for recreationists than Alternative 2.

*Alternative 2* – The paved roadway would provide a safer travel surface for bicyclists. Construction activities would temporarily adversely impact access with delays, noise, and construction traffic. These roads are currently not designated to be closed for hunting seasons. When considered cumulatively with routine maintenance, prescribed burning, and vegetation management, there would not be extended periods where recreationists would be prohibited from utilizing the FMNF.

### 3.3.3 Economics

#### Affected Environment

Currently the roads are being maintained by Berkeley County under a cooperative road maintenance agreement. The County utilizes funds to grade the road for residences and people that use it. Access through the FMNF is critical for residents to travel from their homes to work. Roads are also critical for Forest Service staff for all activities within the FMNF.

#### Direct, Indirect, and Cumulative Effects

*Alternative 1* – The current situation would continue. There would be no change to the economics of the area. Private property lines would not be impacted.

*Alternative 2* - The initial investment of paving the road would be paid for with the Berkeley County Sales Tax funds. Paving would be a long-term investment because it would reduce maintenance costs over time, negating the initial paving cost. Residents owning property along project area would be compensated for

minor linear strips of property that are needed for the road improvements. Berkeley County would likely have some reduction in maintenance costs. The minor property strips through the FMNF that are needed for the improvements would be taken out of Forest Service use, eliminating their potential to contribute directly to economic gains for the Forest Service. These property acquisitions would be minor and would not threaten the ability of the Forest Service to burn, manage, or harvest timber from their lands. Roads within the FMNF provide access for managing forest vegetation through burning, timber stand improvement, and commercial timber sales. Through roads are also needed to suppress insects and disease outbreaks.

### **3.3.4 Environmental Justice**

#### **Affected Environment**

Executive Order 12898 is designed to focus the attention of federal agencies on the human health and environmental conditions in minority and low-income communities. Environmental justice analyses are performed to identify potential disproportionately high and adverse impacts to these target populations from proposed federal actions and to identify alternatives that might mitigate these impacts.

Berkeley County has a minority population of 32.0% as compared to the State of South Carolina, which is 32.8%. The number of persons below the poverty level in Berkeley County is 11.8 percent, as compared to the State of South Carolina as a whole, which is 14.1 percent.

Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks, seeks to protect children from disproportionately incurring environmental health or safety risks that might arise as a result of federal policies, programs or activities.

#### **Direct, Indirect, and Cumulative Effects**

Preliminary analysis of US Census data indicates that the FMNF does not contain populations of minority or low-income communities that would be disproportionately impacted by this alternative since percentages are very similar to state totals for each category. Therefore, further environmental justice analysis is not needed.

### **3.3.5 Cultural Resources**

#### **Affected Environment**

Cultural resources include historic properties as defined in the National Historic Preservation Act (NHPA), cultural items as defined in the Native American Graves Protection and Repatriation Act (NAGPRA), archaeological resources as defined in the Archaeological Resources Protection Act (ARPA), sacred sites as defined in Executive Order 13007, *Protection and Accommodation of Access to "Indian Sacred Sites,"* to which access is provided under the American Indian Religious Freedom Act (AIRFA), and collections. As defined by the NHPA, a historic property or historic resource is any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places

(NRHP), including any artifacts, records, and remains that are related to and allocated in such properties. The term also includes properties of traditional religious and cultural importance (traditional cultural properties), which are eligible for inclusion in the NRHP as a result of their association with the cultural practices or beliefs of an Indian tribe or Native Hawaiian organization. Archaeological resources include any material of human life or activities that is at least 100 years old, and that is of archaeological interest.

Section 106 of the NHPA (PL 89-655) provides the framework for Federal review and consideration of cultural resources during Federal project planning and execution. The Advisory Council on Historic Preservation (ACHP) has promulgated the implementing regulations for the Section 106 process (36 CFR Part 800). The Secretary of the Interior maintains the NRHP and sets forth significance criteria (36 CFR Part 60) for inclusion in the register. Cultural resources may be considered “historic properties” for the purpose of consideration by a Federal undertaking if they meet NRHP criteria. The implementing regulations at 36 CFR 800.16(v) define an undertaking as “a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; those requiring a Federal permit, license or approval; and those subject to state or local regulation administered pursuant to a delegation or approval by a Federal agency.” Historic properties are those that are formally placed on the NRHP by the Secretary of the Interior, and those that meet the criteria and are determined eligible for inclusion.

As a result of the archaeological survey, four new sites (38BK2286, 38BK2287, 38BK2288, and 38BK2289) and one previously recorded site (38BK1173) were identified. Sites 38BK2286, 38BK2287, 38BK2289 and 38BK1173 are recommended as not eligible for the National Register of Historic Places (NRHP). Site 38BK2288, as the boundaries are currently defined within the limits of the project area, cannot be evaluated in regards to the NRHP. It is recommended that the site be avoided during the proposed undertaking. Background research uncovered one previously recorded property, Resource Number U/15/0021, located within the project area. The architectural survey identified 11 previously unrecorded properties within or adjacent to the project area. One non-historic cemetery was also identified within the project area. None of the historic resources are recommended as eligible to the NRHP.

### **Direct, Indirect, and Cumulative Effects**

*Alternative 1* – There would be no effects to archaeological or historic sites from current management activities on the road. Known sites would continue to be undisturbed during maintenance work.

*Alternative 2* – There would be no effects to archaeological or historic sites during construction for this alternative. Site 38BK2288 would be avoided during construction and in subsequent maintenance activities. Should the project have any unanticipated effects on known or unknown historic properties,

then construction would halt and the Forest Service would consult with the State Historic Preservation Office (SHPO) to determine appropriate actions to be taken to prevent or mitigate any adverse effects. Concurrence was obtained from SHPO on December 3, 2010 and is attached in the Appendix.

## **CHAPTER FOUR – CONSULTATION**

Federal, State and local agencies were contacted during the development of this environmental assessment. In addition, individuals were contacted based on the District-wide mailing list. This list is located in the project file.

### **Interdisciplinary Team**

#### **Forest Service Personnel consulted**

Mark Danaher	District Wildlife Biologist
Robert Morgan	Forest Archaeologist
Jim Knibbs	Environmental Coordinator
Robin Mackie	Forest Ecologist/Botanist

#### **Other Agencies Consulted**

U.S. Fish and Wildlife Service  
South Carolina History and Archives, State Historic Preservation Office  
U.S. Army Corps of Engineers

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