

**Fiscal Year 2006**

**Monitoring and Evaluation Annual Report**

**Francis Marion National Forest**

**Revised Land and Resource Management Plan**

**United States Department of Agriculture  
Forest Service  
Southern Region**

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## Forest Supervisor's Certification

I have evaluated the monitoring results and recommendations in this report. I have directed that the Action Plan developed to respond to these recommendations be implemented according to the time frames indicated, unless new information or changed resource conditions warrant otherwise. I have considered funding requirements in the budget necessary to implement these actions.

With these completed changes, the *Revised Land and Resource Management Plan* is sufficient to guide management activities unless ongoing monitoring and evaluation identify further need for change.

Any amendments or revisions to the Forest Plan will be made using the appropriate National Environmental Policy Act procedures.

/s/ Jerome Thomas  
JEROME THOMAS  
Forest Supervisor

September 26, 2007  
Date:

## **Executive Summary of Monitoring and Evaluation Results and Report Findings**

The *Revised Land and Resource Management Plan* (Forest Plan) provides guidance on how the Francis Marion National Forest (FMNF) will be managed. Monitoring determines how well goals and objectives are being met, if standards and guidelines are being properly implemented and whether environmental effects are occurring as predicted. Monitoring results are used to determine if programs should be adjusted or if changes in Forest Plan direction are needed.

Summary of Key Findings:

### **Ecosystem Condition, Health and Sustainability**

An analysis of the Geographic Information System (GIS) database identifies 49,351 acres of longleaf pine forest types. The Forest Plan objective is to have 44,700 acres in this forest type within ten years and 53,500 in the long term. Of this acreage, 39,854 acres occur in Management Area 26 (Sandy Ridges and Sideslopes). Longleaf pine ecosystems and related fire-dependent communities are primarily being maintained by periodic prescribed burning. No acres were planted with longleaf pine in fiscal year (FY) 06.

Database information shows 38,677 acres of mixed pine/hardwood forest which is over two and one half times the Forest Plan objective for this type. However, there was no change in the number of acres of mixed pine/hardwood forest types in Management Area 27 – Loamy Ridges, Flats and River/Creek Bottoms. Though this number is below Forest Plan objectives, it needs to be considered in context with the number of mixed stands that exist across the Forest.

The annual acres being prescribed burned on a 2-4 year cycle during the growing season dropped from 12,100 acres in 2005 to 8,636 acres in 2006. The amount of red-cockaded woodpecker, *Picoides borealis* (RCW) habitat management area burned (HMA) in the last five years stayed the same at approximately 50 percent of the HMA. The total number of acres of prescribed burning done during the growing and dormant season in 2006 was 11,409 and 19,521 acres, respectively. A fluctuation in the number of acres burned is largely attributed to weather conditions.

The Francis Marion RCW population, a primary core recovery population and third largest in the southeast, is close to meeting population objectives for delisting as described in the revised RCW Recovery Plan (2003). Current populations are stable despite modest declines in 2006. The population continues to expand in some areas of the Forest, especially in the core prescribed burning area where almost 31,000 acres were burned last year. However, the Macedonia, Jamestown and Wando-Ion areas are still in need of prescribed burning and midstory vegetative treatments to develop the desired habitat conditions. A variety of thinning vegetation treatments have been or will be completed in these areas in the next several years. Prescribed burning will be implemented in most of these areas to help maintain habitat conditions into the future. There were 7 new and 63 vacant clusters identified on the Forest in 2006 (excluding recruitment sites). Approximately 39% of the vacant clusters are located in or adjacent to pine stands less than 10 years old. Inactive clusters tend to be concentrated in the wildland/urban interface

(WUI) and/or areas where minimal management has allowed midstory succession to occur in the absence of a natural fire regime. Adequate foraging habitat continues to be the most limiting factor for the RCW on the Forest.

There are approximately 44,824 acres of post-Hugo pine and mixed pine stands (stands less than 20 years old) on the Forest. It is expected that the RCW growth rate will increase to recommended levels within the next 20 years as these young stands are thinned and become suitable for foraging. The artificial cavity program appears to be offsetting the lack of natural nesting habitat. The overall outlook for the population is positive, but the future viability of clusters located in the wildland/urban interface is a major concern.

Many stands immediately become foraging habitat for the red-cockaded woodpecker once they are thinned. As a result of recent management actions, some areas of the Forest have excess foraging habitat and opportunities now exist for creating early successional habitat in the longleaf pine ecotype.

Thinnings are also planned to improve habitat conditions for pondberry (*Lindera melissifolia*), American chaffseed (*Schwalbea americana*) and flatwoods salamander (*Ambystoma cingulatum*). A variety of decision documents are in place to allow treatments to address these species. Generally speaking, approximately 210 acres were mechanically mulched and 3,339 acres thinned in 2006. Reducing stand basal areas by thinning and followed by prescribed burning will create and maintain conditions for these and other fire-dependent species in the short and long term.

The Wando area on the Francis Marion National Forest is home to one of two known populations of flatwoods salamander in South Carolina. This salamander, listed as threatened by the US Fish and Wildlife Service, requires ephemeral wetland herbaceous pond habitat surrounded by fire-maintained pine ecosystems. The Wando area is very dense and overgrown, with much of it occurring in the WUI. Historically this area has been difficult if not impossible to prescribe burn due to visibility/safety concerns from smoke on roadways. A variety of stand thinnings are planned in flatwoods salamander habitat in the Wando area (Wando-Ion Project) of the Forest in 2008. This project will also benefit other threatened and endangered species including pondberry and American chaffseed, as well as the Carolina Gopher frog, a sensitive species.

A comprehensive salamander survey planned for in 2006 was not conducted due to exceptionally dry conditions. The survey is now planned for 2008. Prescribed burning is also planned in compartments 114, 115 and 116 in 2008 to benefit threatened and endangered species.

Management and monitoring of potential, endangered, threatened and sensitive species and habitat threats are ongoing on the Forest. Populations in the WUI continue to be impacted by woody species encroachment associated with lack of periodic prescribed fire. Four geographically distinct pondberry populations appear to be viable, though no fruits were observed in 2006. Pondberry appears to be approaching recovery objectives for the species within South Carolina.

Recovery criteria for the reclassification of American chaffseed as stated in the American chaffseed Recovery Plan (1995), includes the protection of 50 viable sites for the species based on biennial monitoring over a 10-year period. Monitoring on the Forest since 1999 suggests that 3 American chaffseed sites are viable (e.g., greater than 100 individuals) and active management is still needed in order to achieve recovery objectives.

American alligator (*Alligator mississippiensis*), bald eagle (*Haliaeetus leucocephalus*), Bachman's sparrow (*Aimophila aestivalis*), West Indian Manatee (*Trichechus manatus*), and wood stork (*Mycteria americana*) are all stable on the Forest. Migrant loggerhead shrike (*Lanius ludovicianus migrans*) is not known to occur here though habitat is stable. The status of Rafinesque's big-eared bat (*Corynorhinus rafinesquii*), southeastern myotis (*Myotis austroriparius*), shortnose sturgeon (*Acipenser brevirostrum*) and Atlantic sturgeon (*Acipenser oxyrinchus*) are unknown since the species are difficult to monitor.

A recently completed report, *Population Trends and Habitat Occurrence of Forest Birds on Southern National Forest, 1992-2004* (General Technical Report NRS-9) gives information on trends of indicator bird species and habitat conditions on the Forest. Post Hurricane Hugo stands are transitioning from young dense stands of seedling/sapling to pole-size and larger trees with dense midstory development that reflect lack of prescribed burning. These conditions are having detrimental impacts on some bird species. Lack of early successional habitat is also impacting game birds such as quail and turkey.

Forest and aquatic communities including ephemeral wetlands, stream fish communities and habitat, aquatic macroinvertebrate community, anadromous and catadromous fishes and pond game fish were monitored in 2006. Large woody debris, an important component for habitat structure, was found lacking in sampled streams and reflects the long term effects of Hurricane Hugo.

Prescribed fire on the Francis Marion National Forest continues to be the most important activity impacting air quality, since it releases fine particles into the atmosphere. In FY 06, emissions of fine particulates (PM<sub>2.5</sub>) from prescribed fires declined to 850 tons per year (t/y) as compared to 972 t/y in 2005 and 867 t/y in 2004. The Forest is compliant with the National Ambient Air Quality Standards for fine particulates in the atmosphere.

Southern pine beetle populations were at very low levels during FY06. A total of 3,736 acres of thinning harvest were offered for sale in FY 2006. Biomass and pulpwood thinnings were the primary silvicultural activities occurring on the Forest in 2006 and more is expected in 2007. The primary purpose of these thinnings is to improve health of forest stands, reduce hazardous fuel accumulations and create/improve habitat for red-cockaded woodpeckers and other fire-dependent species and communities. No early successional habitat was created through even-aged forest management practices.

Best Management Practices and Forest Plan standards and guidelines were fully implemented and effective at protecting water quality, soil productivity and associated resources based on field checks of five units with streams or wetlands sampled in 2006.

## **Sustainable Multiple Forest and Range Benefits**

In FY06, 6.2 million cubic feet (MMCF) were offered for sale, up from the 2.6 MMCF offered for sale in 2005. The allowable sale quantity is 33 MMCF/year during the 10-year period. The main silvicultural practices employed in FY06 were first thinning, biomass thinning and pre-commercial thinning. Prescribed fire was used to release tree seedlings and saplings as well as reduce hazardous fuel loadings.

An equestrian market study was completed for the entire Francis Marion and Sumter National Forests in 2006. Some of the conclusions relevant to the FMNF are to improve program management at all facilities (better use/financial data collection) and continue trail and day-use facility maintenance. We continue to improve our recreation information delivery by an ongoing effort to improve the website, specifically for recreation.

National Visitor Monitoring (NVUM) results indicate that the three items that forest visitor's stated needed to be improved the most were cleanliness of the restrooms, the availability of information on recreation, and the interpretive displays, signs and exhibits.

No visitor use trend information is available at this time. In 2008, NVUM monitoring will be completed again (five-year cycle). At that time, there will be enough information to develop trend information.

The Forest began the construction of the Awendaw Creek canoe and kayak ramp in 2006 and rehabilitation and enhancement of the Sewee Shell Ring interpretive trail and boardwalk is planned in 2008.

The recreation/trails program has been making a lot of infrastructure changes/improvements to the Wambaw Cycle Trail system over the past few years in an attempt to mitigate impacts to the natural resources around the trail as well as improve trail experience so riders want to stay on the trail. Over the past six years, cycle trail improvements have included trail hardening, signing and placing barriers. There is a grant through the Recreational Trails Fund (RTP) program to fence around 12 existing vernal ponds.

No land was acquired on the Francis Marion National Forest during this fiscal year due to budget.

## **Organizational Effectiveness**

The Francis Marion road system continued to receive heavy use by the public and commercial users. Emphasis continues on maintaining and reconstructing roads to meet the objective maintenance level, meet current design standards and best management practices, and reduce negative impacts to resources with the focus on watershed health. Road projects to support timber activities continue to focus on surface and culvert replacement. No new miles of road were constructed in FY 06.

The Forest's new road construction miles continue to be much lower than the target projected in the Forest Plan. The availability of additional funding from Knutson-Vandenberg Trust Fund special legislation allowed the Forest to surface, reconstruct, and maintain a significant mileage above the last few years. These dollars were focused on the newly acquired tracts and adjacent existing roads.

The FMNF has not been able to close any significant mileage of roads however; the total mileage of roads is nearly ten percent below the mileage projected in the Forest Plan.

The Francis Marion has continued to conduct road condition surveys to determine the amount of deferred maintenance. The FY 06 survey focused on the Forest's primary open roads that are classified as maintenance level 3, 4, and 5. The deferred maintenance on these 389.1 miles of open road was estimated at \$13,786,688. The Forest decommissioned one (1.0) mile in FY 06 from the existing system. The Forest will be looking to shift some road miles into a lower maintenance level in future years due to reduced maintenance budgets.

Nine heritage sites were monitored in 2006 using a sampling strategy to select priority heritage assets to review. One site was damaged by forest users and another site was damaged by eroding water. The other sites were undisturbed. The most serious damaged occurred on sites that are being eroded by maintenance and use of the Atlantic Intracoastal Waterway.

## **Chapter 1. Introduction**

The Francis Marion National Forest is approximately 252,840 acres in size and is located on the lower coastal plain of South Carolina. The *Revised Land and Resource Management Plan* (Forest Plan) was approved on December 18, 1995 and guides all natural resource management activities and sets management standards for the Forest. Part of the mission of the Forest Service is to protect and manage the resources of the national forest so that they best demonstrate the sustainable multiple-use management concept. The Forest provides a number of goods and services for the public including timber, outdoor recreation, water, wildlife, fish and wilderness.

Forest Plan monitoring and evaluation is conducted to determine if the Forest is moving toward or achieving the desired conditions for resources. Forest Service resource specialists, universities, state resource agencies and contract specialists conduct surveys and inventories on a variety of natural resources annually.

## Chapter 2. Monitoring Results and Findings

Chapter 2 of this report includes the monitoring questions and tasks defined in Chapter 5 and Appendix B of the Forest Plan. Appendix B contains the detailed monitoring task sheets. In this report, the monitoring questions are numbered consecutively with the corresponding task sheet in parentheses based on the page number in Appendix B.

### *Issue 1. Ecosystem Condition, Health and Sustainability*

#### **Sub-Issue 1.1 - Biological Diversity**

1. Are the acres of longleaf forest type increasing at a rate to achieve objective (B-4)?

##### Information

This monitoring question is responsive to goals 1, 6, 7 and 8 and objective 4. The intent is to increase the longleaf pine forest type to 44,700 acres within 10 years and to maintain, restore, and enhanced the longleaf pine ecosystem.

- Acres of longleaf pine forest type.

##### Results

The GIS database shows 49,351 acres of longleaf pine forest types on the Francis Marion NF. This is 110% of the objective.

##### Findings

No additional action is needed.

2. Are the acres of longleaf forest type in Management Area 26 (MA-26) increasing at a rate to achieve objective B-5?

##### Information

This monitoring question is responsive to goals 1, 6, 7 and 8 and objective MA-26-Objective-1. **MA-26-Objective-1** is to have 40,000 acres of longleaf pine forest type within the next 10 years in MA-26. The longleaf pine ecosystem is maintained, restored, and enhanced.

- Acres of longleaf pine forest type in MA- 26.

## Results

The GIS database shows 39,854 acres of longleaf pine forest types in MA- 26.

## Findings

No additional action is needed.

3. Are sufficient longleaf pine management type acres being burned on a 2 to 4 year growing season burn cycle to achieve objectives (B-6)?

## Information

This monitoring question is responsive to goals 1, 6, 7 and 8 and objectives 1 and 5. **Objective 1** is to maintain a red-cockaded woodpecker population of 450 clusters. **Objective 5** is to restore the role of growing-season fires on 16,000 acres of longleaf forest types in the next 10 years and on 40,000 acres in the long term by prescribed burning on a 2 – 4 year cycle. The red-cockaded woodpecker population is maintained, and the longleaf pine ecosystem is maintained, restored, and enhanced.

- Annual acres and location of longleaf pine management type stands burned on a 2 to 4 cycle during the growing season (April – September).
- Percent of the 160,000 RCW Habitat Management Area (HMA) acres which has been prescribed burned in the last 5 years.
- Percent of the longleaf pine forest types which has been prescribed burned in the last 5 years.
- Percent of MA- 26 that has been burned in the last 3 years.

Results

The following table summarizes monitoring items

**Table 2-1. Monitoring Item and Results for FY 2004-2006**

<b>Monitoring Item</b>	<b>FY04-Results</b>	<b>FY05-Results</b>	<b>FY06-Results</b>	<b>Desired Condition</b>
Annual acres burned on 2 to 4 year cycle during the growing season	10,000 acres	12,100 acres	8,636 acres	See Objective 5
Percent of RCW HMA burned last 5 years	50%	50%	50%	See Objective 1 Prescribed burning cycle of 2 – 5 years throughout the entire HMA (ROD – RCW FEIS and standard FW-83)
Percent of longleaf pine forest types burned last 5 years	60%	61%	62%	See Objective 1
Percent MA-26 burned last 3 years	75%	60%	50%	MA-26-G-1 states “Restore expand and maintain the longleaf pine ecosystem and related fire-dependent communities.” Standard MA-26-2 states burn pine stands on a 2 – 3 year cycle.

Findings

The Forest burned fewer acres in FY 2006 than FY 2005 due primarily to weather conditions (there were a number of days in March and May that were too dry to burn). Approximately the same amount of dormant season acres were prescribed burned. The growing season prescribed burning in the longleaf type continues to improve and move toward meeting objective 5. Prescribed burning in the last 5 years within the RCW HMA remained constant at 50%. This trend needs to continue since the Forest is still below requirements for a prescribed burning cycle of 2 – 5 years.

The trend for prescribed burning longleaf pine forest types increased again to 62%. Fire is critical to restoring and maintaining this fire-dependent community, and thus the percent burned needs to increase in the future.

The forest has burned approximately 50% of MA-26 in the last 3 years. This reflects minor short term changes based on fuels and weather conditions. The intent is to remain on a 2 to 3 year cycle in MA-26

4. Are the acres of mixed pine/hardwood stands increasing at a rate to achieve the objective B-8?

#### Information

This monitoring question is responsive to goals 1, 6, 7 and 8 and objective 11. **Objective 11** is to increase the acres managed as mixed pine/hardwood forest types to 14,800 in the next 90 years. The amount of mixed pine and hardwood stands has increased, and mast-producing hardwoods are common.

- The acres managed as mixed pine/hardwood forest types.

#### Results

The GIS database shows 38,677 acres of mixed pine/hardwood forest types, 130 acres less than reported for FY 2005. It is over 2.6 times the objective.

#### Findings

No additional action is needed.

5. Are the acres managed as mixed pine/hardwoods in Management Area 27 (MA-27) increasing at a rate to achieve the objective (B-9)?

#### Information

This monitoring question is responsive to goals MA-27-G-1 and MA-27-G-3 and objective MA 27-O-1. **Objective MA-27-O-1** is to have 6,700 acres managed as mixed pine/hardwood forest types to 14,800 in the next 90 years. Mixed pine/hardwood stands are found throughout this area on a variety of sites. Mast-producing hardwoods are common in hardwood stands, mixed stands and scattered throughout pine stands.

- The acres managed as mixed pine/hardwood forest types in MA-27.

#### Results

The GIS database shows 5,109 acres of mixed pine-hardwood types in MA- 27. This is the same figure reported for FY 2005. The context of the current mixed pine-hardwood acreage under objective 11 (forest-wide) above should be remembered when looking at the figures for MA- 27.

### Findings

No additional action is needed.

6. In management area 27, do loblolly pine stands by age 40 have 30 percent of the dominant/codominant canopy classes in mast-producing hardwoods (B-10)?

### Information

This monitoring question is responsive to goal MA-27-G-3 and objective MA 27-O-2. The objective (**MA 27-O-2**) is to have 30 percent of the dominant/codominant canopy in 40 year old or greater loblolly pine stands in mast-producing hardwoods. Mast-producing hardwoods are common in hardwood stands, mixed stands and scattered throughout pine stands.

- Composition of 40 year old or greater loblolly pine in MA-27.

### Results

The results for FY 2006 are the same as those discussed in the FY 2004 monitoring report.

### Findings

Baseline information will be used in the Forest Plan revision to establish what actions are needed to achieve desired results.

7. In management area 27, what conditions are needed in stand regeneration and development to achieve the objective (B-11)?

### Information

This monitoring question is responsive to goal MA-27-G-3 and objective MA 27-O-2. The objective (**MA 27-O-2**) is to have loblolly pine stands by age 40 should have 30 percent of the dominant and/or codominant canopy classes in mast-producing hardwoods. Mixed pine/hardwood stands are found throughout this area on a variety of sites. Mast-producing hardwoods are common in hardwood stands, mixed stands and scattered throughout pine stands.

- Specific items will be established during study area in MA- 27.

## Results

The results for FY 2006 are the same as those discussed in the FY 2004 monitoring report.

## Findings

Baseline information will be used in the Forest Plan revision to establish what conditions are needed to achieve the desired results.

8. Are pine stands being thinned as planned (B-17)?

## Information

This monitoring question is responsive to goals 4, 6, 7 and 8 and objective 9. **Objective 9** states create conditions on 38,000 to 50,000 acres of pine stands which release over crowded live crowns. The Forest continues to contribute to the long term economic stability, manage a sustainable forest, provide for wildlife habitat needs and sustain biological diversity.

- Acres of pine stands thinned.

## Results

A total of 3,736 acres of thinning harvest were offered for sale in FY 2006.

## Findings

No additional action is needed.

9. Are red-cockaded woodpecker (RCW) clusters maintaining 350 or greater potential breeding groups (B-24)?

## Information

This monitoring question is responsive to goals 1, 3, 4, 7 and 8 and objectives 1, 4, 5 and 9. Provide a diversity of wildlife species. Provide quality habitat which supports viable populations of native wildlife species. The Forest provides adequate habitat for various animals whose populations were previously threatened by dwindling habitat.

- number of active RCW clusters
- number of groups nesting

## Results

Potential breeding groups (PBGs) on the Francis Marion National Forest (FMNF) decreased approximately 3.6% during 2006 to 319 PBGs, down from 331 in 2005. The 2003 Revised RCW Recovery Plan identifies the minimum population size for delisting the Francis Marion Primary Core population at 350 PBGs. The current number of managed clusters on the Francis Marion is 407.

Restoration efforts during 2006 included installation of 74 structures in 45 clusters. Structures included 12 drilled cavities, 9 drilled starts, 19 inserts, 1 replacement, and 33 restrictor plates. Cavity installation on the Forest represents one of the most aggressive artificial cavity programs in the Nation. The FMNF is a testament to the fact that artificial cavities and restrictor plates can be used to maintain and enhance RCW populations on forest lands lacking sufficient numbers of cavity trees. As of 1 January 2007, approximately 2,471 drilled cavities, drilled starts and inserts have been installed.

Prescribed burning was beneficial to the RCW during 2006. Over 30,930 acres were burned during the 2006 season, and many high priority areas were targeted. However, areas such as the Macedonia, Jamestown and Wando-Ion are still in dire need of prescribed burning and/or hardwood release treatments. Approximately 50% of the RCW clusters are threatened by encroachment from woody vegetation in the WUI. The Wando-Ion area is in one of the most rapidly urbanizing areas on the Forest. Unfortunately, it is also home to numerous rare, threatened and endangered species. In terms of State Priority Species, 28 species have been documented within the area. Federally threatened and endangered species known from the Wando-Ion Area include high densities of RCW's, one of two known South Carolina populations of flatwoods salamander, pondberry, and American chaffseed. All four of these federally listed species have become adapted to, if not dependent upon, fire maintenance. There are approximately 62 active RCW clusters in the Wando-Ion area that have the potential to be impacted by woody encroachment associated with the WUI.

Approximately 210 acres were mulched and 3,339 acres thinned during 2006. Mulching was completed by Land Clearing Services, Inc. and primarily concentrated on RCW clusters and American chaffseed sites on the Forest. Mulching operations instantly create open park-like stand conditions and reduce the amount and distribution of combustible fuels. Unfortunately, mulching is one of the most expensive mechanical treatments conducted on the FMNF. It is best used in very specific circumstances when other methods are not practicable.

Biomass thinning appears to be the most cost efficient method for thinning pre-merchantable pine on the Forest. Otherwise, stand treatments would not be possible. Thinning and mulching operations improve habitat conditions for a variety of plant and animal species on treated sites, but it is crucial that these sites continue to be maintained via prescribed burning or other silvicultural treatments.

If mechanically treated stands are not subsequently managed with an adequate prescribed burning regime, the desired forest conditions in these stands cannot be maintained. As such, alternatives to prescribed burning will need to be examined and implemented to achieve desired forest conditions.

### Findings

The Francis Marion RCW Population, a primary core recovery population and third largest in the southeast, is close to meeting population objectives for delisting as described in the revised RCW Recovery Plan (2003). There were 350 active clusters following the 2006 breeding season, down from 351 in 2005. Although not monitored, there were 7 new active clusters identified during 2006.

The population still appears to be stable despite modest annual declines from 363 clusters in 2004 to 351 in 2005 and 350 in 2006. The population continues to expand in the core prescribed burning area and has declined in other areas. Inactive clusters tend to be concentrated in the WUI and/or areas where minimal management has allowed midstory succession to occur. As of 2006, there are approximately 63 vacant clusters on the Forest, excluding recruitment sites. Of these 63, approximately 39% are located in or adjacent to pine stands less than 10 years old.

Adequate foraging habitat continues to be the most limiting factor for the RCW on the Forest, as our artificial cavity program appears to be offsetting the lack of natural nesting habitat. There are approximately 44,824 acres of post-Hugo pine and mixed pine regeneration on the Forest. It is expected that the RCW growth rate will increase to the recommended rate within the next 20 years as these young stands are thinned and become suitable for foraging.

The overall outlook for the FMNF RCW population is positive, but the future viability of clusters located in the WUI is a major concern. Mechanical silvicultural treatments are extremely important for short term habitat enhancement in pine stands. However, if thinned stands are incapable of being maintained by prescribed fire, midstory succession will continue to be a recurring problem and will likely lead to additional RCW cluster losses.

10. Are populations of all existing PETS animal species being maintained or increased (B-25)?

### Information

This monitoring question is responsive to goals 1, 5, 6, 7 and 8 and objectives 1, 2, 4, 5, 9, 11, 12, 13, 14, and 15. The Forest provides adequate habitat for various animals whose populations were previously threatened by dwindling populations.

- Numbers of PETS animals and related habitats.

## Results

The results for FY 2006 are the same as those discussed in the FY 2004 monitoring report table that displays the status of PETS animals on the Francis Marion National Forest.

Six bald eagle nests are now known from the Forest. Four of the six nests fledged 5 total young in 2006 based on monitoring conducted by South Carolina Department of Natural Resources (SC DNR).

The flatwoods salamander is a federally threatened mole salamander and occurs within fire-maintained pine flatwoods. It is listed as “highest priority” in the South Carolina Comprehensive Wildlife Conservation Strategy. Existing populations are currently threatened by habitat loss and degradation associated with agriculture, urbanization and certain silvicultural practices. It needs shallow, seasonally flooded, isolated wetlands for breeding that are free of fish. Ideal breeding wetlands are those with: 1) open canopies of cypress or *Nyssa* spp.; 2) abundant graminaceous groundcover vegetation along the ecotone and/or within the wetland itself; 3) appropriate hydroperiod for larval development; 4) absence of predatory fish; and, 5) an ecotone of frequently burned longleaf pine-wiregrass flatwoods and savannas in good to excellent vegetative condition.

The Wando-Ion Area is home to one of only two known flatwoods salamander populations in South Carolina, and there is great concern about the viability of this amphibian on the Forest. Only five individual adults have been captured on the Forest within the past twenty years. Plans are in place for a large scale small diameter thinning within flatwoods salamander habitat in the Wando-Ion area of the Forest. As with the RCW, midstory succession resulting from fire exclusion or inadequate fire frequency is likely the biggest threat to flatwoods salamander in the Wando-Ion area. The area is extremely dense and overgrown, and occurs in the WUI which makes prescribed burning difficult or precludes its use entirely.

A comprehensive survey plan for the salamander was developed in 2006, but due to exceptionally dry conditions on the FMNF the survey will not be conducted until 2008. Similarly, prescribed burning plans were developed in 2006 to burn compartments such as 114, 115 and 116. However, these plans are not likely to be implemented until 2008. Plans to prescribe burn the aforementioned compartments could be delayed even longer if thinning operations are implemented in 2008. Adequate fire maintenance is an absolute necessity in the Wando-Ion area.

As previously mentioned, mulching activities were conducted to enhance American chaffseed and RCW habitat during 2006. Approximately 20 acres of American chaffseed habitat were mulched on the FMNF during 2006.

## Findings

Implementation of the Wando-Ion project decision and an adequate prescribed burning regime are needed in order to maintain and restore habitat for the flatwoods salamander. These activities will benefit pondberry and American chaffseed as well. Biomass and commercial thinnings in the Macedonia and Wando-Ion areas are the best habitat enhancement projects that we can do to benefit PETS species on the Forest. However, general observations indicate that these mechanical treatments are relatively short lived (i.e., dependent on species composition and structure of midstory vegetation - competing hardwoods and loblolly pine may reach undesirable heights and densities within 3-5 years). Without adequate fire maintenance, midstory encroachment will be a recurring problem in mechanically treated stands. Additional thinning, hand-clearing and prescribed burning activities will hopefully improve habitat for PETS species, but we also need to examine alternative methods for restoring natural community structure and composition as well.

11. Are the number of populations of existing PETS plants being maintained or are they increasing (B-26)?

## Information

This monitoring question is responsive to goals 1, 2, 5, 6, 7 and 8 and objective 13. Plant species with viability concerns are found to be more common than previously thought. The number of PETS plant populations is being maintained or increased.

- Location and number of existing PETS plant populations.

## Results

The results for PETS plants discussed in the FY 2005 Monitoring Report have not changed for FY 2006.

## Findings

Our knowledge of PETS plant distributions, including habitat associations and habitat threats continues to increase. Management and monitoring of PETS species on the Forest are ongoing. Populations occurring at the WUI continue to be threatened by woody species encroachment associated with the lack of prescribed fire. However, efforts to manage these sites, at a manageable scale, are increasing.

Recovery criteria for the delisting of pondberry include the permanent protection of 25 self-sustaining populations throughout the range of the species (Recovery Plan for Pondberry, 1993). Based on monitoring conducted on the FMNF, four

geographically distinct populations for pondberry appear to be viable, though no fruits were observed at either of these populations. Pondberry appears to be approaching recovery objectives for the species within South Carolina.

Recovery criteria for the reclassification of American chaffseed as stated in the American chaffseed Recovery Plan (1995) includes the protection of 50 viable sites for the species based on biennial monitoring over a 10-year period. At the time the recovery plan was written, 72 extant sites were known with the majority (42 sites) known from South Carolina. Monitoring on the Forest since 1999 suggests that 3 American chaffseed sites are viable (i.e., greater than 100 individuals), and active management is still needed in order to achieve recovery objectives. Population enhancement at suitable sites where individuals occur in low numbers should be investigated.

12. Are we maintaining viable populations of early successional native species and the habitat to support them (B-27)?

#### Information

This monitoring question is responsive to goals 1, 3, 4, 7 and 8 and objectives 12 and 13. **Objective 12** is to maintain 5,000 to 10,000 acres of early successional habitat in the short and long term. Provide a diversity of wildlife species. Provide quality habitat which supports viable populations of native wildlife species. Provide opportunities to enjoy a variety of recreational uses of wildlife.

- Acres in grass-forb habitat (Acres in 0-3 year class, permanent openings, wildlife openings, road rights-of-way, utility rights-of-way) in the short and long term.

#### Results

No early successional habitat is being created through even-aged forest regeneration. Thinning stands to moderate basal areas followed by prescribed burning create openings in the forest canopy that somewhat mimics early successional habitat. GIS records show 821 acres in wildlife and permanent openings and 76 acres in the 0-3 year age class.

#### Findings

The Forest needs to begin doing even-aged regeneration harvesting in order to meet Objective 12 to provide additional habitat for maintaining viable populations of early successional native species. The Honey Hill project will begin to address this need.

13. Are we maintaining viable populations of older forest native species and the habitat to support them (B-28)?

### Information

This monitoring question is responsive to goals 1, 3, 4, 7 and 8 and objectives 1, 2, 9, 11, 14, and 16. Provide a diversity of wildlife species. Provide quality habitat which supports viable populations of native wildlife species. Provide opportunities to enjoy a variety of recreational uses of wildlife.

- Acres in late successional habitat (pine > 80 years, hardwood > 100 years, and mixed stands >100 years).

### Results

Information in GIS indicates the following:

- 9,687 acres of pine types over age 80
- 12,142 acres of hardwood types over age 100
- 473 acres of mixed pine-hardwood types over age 100

### Findings

No additional action is needed.

14. Are we maintaining viable populations of native bird species and the habitat to support them (B-29)?

### Information

This monitoring question is responsive to goals 1, 3, 4, 7 and 8 and objectives 1, 2, 3, 4, 5, 8, 9, 11, 12, 13, 14, 15, and 16. Provide a diversity of wildlife species. Provide quality habitat which supports viable populations of native wildlife species. Provide opportunities to enjoy a non-consumptive uses of wildlife such as bird watching.

- Population trend of MIS bird species.

### Results

Technical report, *Population Trends and Habitat Occurrence of Forest Birds on Southern National Forests, 1992-2004* (General Technical Report NRS-9) indicates that mean observations per count for pileated woodpeckers have slightly declined from the early 1990s on the Francis Marion National Forest. However, declines in the South Atlantic Coastal Plain generally have been negligible.

Prairie warblers, on the other hand, have increased in the South Atlantic Coastal Plain while mean observations on the Francis Marion National Forest show sharp declines.

## Findings

The Regional database needs to be made operational in order to make estimates on Forest-wide trends.

Likely reasons for the decline in pileated woodpeckers are tied to lack of old growth trees as a result of Hurricane Hugo in 1989 and an ever increasing density in the pine midstory component. Likewise, post Hurricane Hugo damaged stands in the past have provided suitable habitat for the prairie warblers but now may no longer be suitable. Pine and mixed forest stands are now transitioning into larger pole-sized stands and are no longer providing ideal habitat.

15. Are we maintaining viable populations of turkey and the habitat to support them (B-30)?

## Information

This monitoring question is responsive to goals 1, 3, 4, 7 and 8 and objectives 2, 3, 11, 13, and 16. Provide a diversity of wildlife species. Provide quality habitat which supports viable populations of native wildlife species. Provide opportunities to enjoy consumptive uses of wildlife such as hunting and fishing.

- Population index trend of Eastern wild turkey.

## Results

Technical report, *Population Trends and Habitat Occurrence of Forest Birds on Southern National Forests, 1992-2004* (General Technical Report NRS-9) indicates that mean observations per count have slightly declined from the early 1990s on the Francis Marion National Forest. However, the declines in the South Atlantic Coastal Plain have been sharper.

## Findings

Two main reasons for the likely decline are increased urbanization and midstory/understory growth that are impacting desired habitat across the region. Continuing an aggressive prescribed burning program, restoring mast producing hardwood stands and increasing silvicultural activities that reduce basal areas in pine stands are needed to continue the maintenance and development of quality nesting and brood rearing habitat for wild turkey.

16. Are we maintaining viable populations of quail and the habitat to support them (B-35)?

#### Information

This monitoring question is responsive to goals 1, 3, 4, 7 and 8 and objectives 4, 5, 9, 13, and 16. Provide a diversity of wildlife species. Provide quality habitat which supports viable populations of native wildlife species. Provide opportunities to enjoy consumptive uses of wildlife such as hunting and fishing.

- Population index trend of northern bobwhite quail.

#### Results

Technical report, *Population Trends and Habitat Occurrence of Forest Birds on Southern National Forests, 1992-2004* (General Technical Report NRS-9) indicates that mean observations per count have sharply declined for quail from the early 1990s on the Francis Marion National Forest. However, the declines in the South Atlantic Coastal Plain have not been as steep.

#### Findings

Declines in quail are most likely associated with a large number of forest stands moving from seedling/sapling-size to pole-size trees. There has been little thinning and no regeneration harvest on the Francis Marion for almost 15 years so brood rearing habitat is very limited.

17. Are we maintaining viable populations of native amphibians and the habitat to support them (B-37)?

#### Information

This monitoring question is responsive to goals 1, 3, 4, 7 and 8 and objectives 2, 11, 13, and 14. Provide for a diversity of wildlife species. Provide quality habitat which supports viable populations of native wildlife species. Provide opportunities to enjoy non-consumptive uses of wildlife such as photography and viewing.

- Number of individuals sighted.
- Acres of temporary pond habitat.

#### Results

There are no new data on amphibians other than PETS as reported under monitoring question #11.

### Findings

No additional action is needed.

18. Are we maintaining viable populations of native species and the habitat to support them (B-38)?

### Information

This monitoring question is responsive to goals 1, 2 and 8 and objectives 13 and 14. Throughout the Forest landscape, there is an ecologically sound distribution of plant communities and PETS plant habitats.

- Acreage of under-represented plant communities/PETS habitats

### Results

The results discussed in the FY 2005 Monitoring Report have not changed for FY 2006.

### Findings

No additional action is needed.

19. What is the status and trends in stream fish communities in relationship to management activities and habitat conditions? What are current habitat conditions and trends (B-39 Amendment # 2)?

### Information

This monitoring question is responsive to goals 1, 3, 4, 7 and 8. Throughout the Forest landscape, there is an ecologically sound distribution of aquatic communities.

- Repeated quantitative sampling of fish communities, including diadromous species, in streams representative of 10 small watersheds across the Forest. Measure habitat parameters using BVET protocol where fish sampling is conducted.

### Results

Fish inventory sampling in Francis Marion National Forest streams was conducted in 1993 by Hansbarger and Dean (1994). A total of 53 streams were sampled across the Forest post Hurricane Hugo. Stream population monitoring efforts in some of these same streams began in 2002 and continued through 2004 (Table 2-2). Repetitive sampling in streams varied from year to year due to

drought conditions (2002), above average rainfall (2003) and below average rainfall (2004). Dry stream channels were encountered with drought and below average rainfall. Stream channels were indiscernible with the swampy conditions produced by above average rainfall. Stream sampling in 2006 occurred during the late winter-early spring months when water levels were more stable. Twenty-two of the original 53 streams were resurveyed in 2002, 2003 and 2006. The discussion in this report does not include 1993 streams that were not resurveyed. Two additional streams were surveyed in 2003 and 2004 that were not surveyed in 1993.

**Table 2-2. Fish Survey Sites**

Stream	Site #*	Watershed	Quadrangle	# Species Captured				
				1993	2002	2003	2004	2006
Cooter Creek	12	Awendaw Creek	Ocean Bay	3	10			8
Steed Creek	30	Awendaw Creek	Ocean Bay	9	11			
Fogarty Creek	54	Wando River	Cainhoy			3	3	5
Old House Creek	55	Wando River	Cainhoy			3	5	5
Pepper Gully	23	Wando River	Cainhoy	7				9
Harleston Dam Creek	50	Quinby Creek	Ocean Bay	3		7		
Northampton Creek	14	Quinby Creek	Ocean Bay	10	4	6		9
Muddy Creek	24	Huger Creek	Huger	7	1			5
UT Fox Gully	4	Huger Creek	Bethera	10		4		3
Bullhead Run	2	Wadboo Creek	Cordesville	14		2		7
UT Cane Gully	48	Wadboo Creek	Bonneau	2				1
UT Wadboo Creek	22	Wadboo Creek	Bonneau	5		4		5
Beauford Branch	21	Wedboo Creek	Alvin	8	8	8		10
UT Meeting House	8	Wedboo Creek	Bonneau	9				7
Wedboo Swamp	9	Wedboo Creek	Alvin	6	9			
Dutart Creek	32	Dutart Creek	Jamestown	3		2		8
Gal Branch	34	Echaw Creek	Cedar Creek	9		6		
Gravel Run	46	Echaw Creek	Jamestown	8		3		
UT Echaw Creek	36	Echaw Creek	Honey Hill	11	4	13		11
Red Bluff Creek	7	Red Bluff Creek	Honey Hill	7		9		8
UT Big Morgan Creek	6	Wambaw Creek	Honey Hill	6				9
UT Cane Branch	38	Wambaw Creek	Honey Hill	7				11
UT Mill Branch	40	Wambaw Creek	Santee	8	9	5		
UT Wambaw Creek	44	Wambaw Creek	Santee	7	3	6		14

\*Site numbers correspond to sites in Hansbarger and Dean (1994). UT = unnamed tributary.

Habitat inventory protocol was developed in 2002 using BVET methods (Dollof et al 1993). Habitat inventory was attempted in 2003 and 2004, however, dry conditions in 2003 and swampy conditions in 2004 restricted inventory to short segments of streams.

Hansbarger and Dean (1994) collected 35 fish species in 53 streams across the Forest in 1993. Repeated sampling in 22 of those streams in 2002, 2003 and 2006 produced 37 species (Table 2-3). The same 22 streams in 1993 contained 29 species. Eight species captured in 1993 were not present in those 22 streams in 2002, 2003 and 2006. However, one species, the common shiner, may have been misidentified in 1993 since its range does not extend into South Carolina. Seven species captured in 2002, 2003 and 2006 were not present in those 22 streams in 1993, although three of those species were represented from other 1993 sampled streams. The number of species captured by watershed in 1993, 2002, 2004 and 2006 are displayed in Table 2-4.

**Table 2-3. Species Captured in 1993, 2002, 2003, 2004 and 2006**

		1993	2002	2003	2004	2006
	<b># Watersheds</b>	9	6	9	1	10
	<b># Streams</b>	17	9	15	2	18
<b>Species</b>						
<b>Amblyopsidae</b>						
<i>Chologaster cornuta</i>	swampfish		x			x
<b>Amiidae</b>						
<i>Amia calva</i>	bowfin			x		
<b>Anguillidae</b>						
<i>Anguilla rostrata</i>	American eel	x	x	x	x	x
<b>Aphredoderidae</b>						
<i>Aphredoderus sayanus</i>	pirate perch	x	x	x		x
<b>Atherinidae</b>						
<i>Labidesthes sicculus</i>	brook silverside	x				
<b>Catostomidae</b>						
<i>Erimyzon oblongus</i>	creek chubsucker	x	x	x		x
<b>Centrarchidae</b>						
<i>Acantharchus pomotis</i>	mud sunfish	x	x	x	x	x
<i>Centrarchus macropterus</i>	flier	x	x	x		x
<i>Enneacanthus gloriosus</i>	bluespotted sunfish	x	x	x		
<i>Enneacanthus obesus</i>	banded sunfish	x		x		x
<i>Lepomis auritus</i>	redbreast sunfish	x				x
<i>Lepomis gibbosus</i>	pumpkinseed			x		x
<i>Lepomis gulosus</i>	warmouth	x	x	x		x
<i>Lepomis macrochirus</i>	bluegill	x	x	x		
<i>Lepomis marginatus</i>	dollar sunfish	x	x	x		
<i>Lepomis punctatus</i>	spotted sunfish	x		x		x
<i>Micropterus salmoides</i>	largemouth bass	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
<i>Notropis chalybaeus</i>	ironcolor shiner	x				
<i>Notropis cummingsae</i>	dusky shiner	x				
<i>Notropis petersoni</i>	coastal shiner	x	x			x
<b>Esocidae</b>						

<i>Esox americanus</i>	redfin pickerel	x	x	x	x	x
<i>Esox niger</i>	chain pickerel	x				x
<b>Elassomatidae</b>						
<i>Elassoma evergladei</i>	Everglades pygmy sunfish					x
<i>Elassoma zonatum</i>	banded pygmy sunfish	x	x	x		x
<b>Fundulidae</b>						
<i>Fundulus chrysotus</i>	golden topminnow			x	x	
<i>Fundulus diaphanus</i>	banded killifish					x
<i>Fundulus lineolatus</i>	lined topminnow	x				
<b>Ictaluridae</b>						
<i>Ameiurus natalis</i>	yellow bullhead	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>	scalyhead darter	x	x			
<i>Etheostoma serrifer</i>	sawcheek darter					x
<b>Poeciliidae</b>						
<i>Gambusia holbrooki</i>	Eastern mosquitofish	x	x	x	x	x
<i>Heterandria formosa</i>	least killifish		x			
<b>Soleidae</b>						
<i>Trinectes maculatus</i>	hogchoker		x			
<b>Umbridae</b>						
<i>Umbra pygmaea</i>	eastern mudminnow	x	x	x	x	

**Table 2-4. Number of Species Captured per Forest Watershed.**

Watershed	# Species Captured	
	1993	2002-2004
Awendaw Creek	10	15
Wando River	4	13
Quinby Creek	11	11
Huger Creek	11	18
Wadboo Creek	17	13
Wedboo Creek	12	28
Dutart Creek	3	8
Echaw Creek	19	18
Red Bluff Creek	7	11
Wambaw Creek	12	23

All species captured in 2002-2004 and 2006 were native to the Santee Cooper Drainage (Warren, et al. 2000), except for the banded killifish. In addition, the population status of these species are considered to be currently stable throughout all or a significant portion of their range. The ironcolor shiner (a native species) captured in 1993 (in 7 of the 22 streams) is considered vulnerable. The vulnerable population status indicates that the species may become endangered or threatened by relatively minor disturbances to its habitat or that it deserves careful monitoring of its distribution and abundance to determine its status. Introduced

species were present in the 1993 surveys in streams that were not surveyed in 2002-2004 and 2006.

The trophic composition of the fish assemblage remains unchanged since 1993. Insectivores dominate the community, indicating that the invertebrate food source is stable. Two predator fish present in 1993 were absent in the 2002-2004 and 2006 surveys. However, redbfin pickerel were abundant and occurred in all but two streams. Bowfin (another predator fish) was present in the 2003 surveys, possibly due to higher water levels in the streams. Two omnivore species were present in the streams and increase as the physical and chemical habitat deteriorates.

The majority of species captured in these streams are classified as intermediate in their tolerance to human influences, adept at exploiting particular types of disturbances. One species captured in 1993 is considered intolerant or very sensitive to human influences. Intolerant species are among the first to be decimated after disturbances and the last to recolonize after normal conditions have returned. The ironcolor shiner is an intolerant species and was absent in the 2002-2004 surveys. Tolerant species increase in the population with environmental degradation. There was no increase in tolerant species in the streams sampled.

American eel were captured in five out of the nine streams sampled in 2002 as compared to only two streams out of 53 in 1993. However, this may be attributed to a more intense sampling design. Captured eels 147 mm or larger were pit tagged and recorded in 2003 and 2004. Smaller eels could not be tagged. American eel were captured in seven streams in 2003. Four of these streams were dry in 2002 and were not sampled. Two American eels were recaptured in Old House Creek in 2004. Additional eels captured from the stream were pit tagged. Eels captured on Northampton Creek were also tagged. Other 2003 sampled streams where American eel were tagged were dry in 2004. In 2006, American eel were captured in seven streams.

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.

## Findings

Thirty-nine species have been captured in 24 streams across the Francis Marion National Forest. Repetitive sampling has occurred in those streams when water level conditions were favorable.

All of the fish except for one captured are considered native to the watershed. The population status of native species is considered to be currently stable throughout all or a significant portion of their range, with the exception of the American eel. The ironcolor shiner (vulnerable species) was not captured during the sampling period. This species was captured in five of the seventeen streams in 1993 surveys.

Insectivores dominate the fish community in sampled streams across the Forest, indicating that the invertebrate food source is stable. There was no significant change in trophic composition that would indicate any physical or chemical deterioration of sampled streams.

The majority of species captured in the sampled streams are classified as intermediate in their tolerance to human influences. There were no intolerant species captured; however, there was no increase in tolerant species either.

Large woody debris, an important component for habitat structure, is lacking in the sampled streams.

20. What is the status and trends in aquatic invertebrate (aquatic insects, mollusks, crayfish) populations in relationship to management activities and habitat conditions (B-40 Amendment #2)?

## Information

This monitoring question is responsive to goals 1, 3, 4, 7 and 8. Throughout the Forest landscape, there is an ecologically sound distribution of aquatic communities.

- Population trends will be measured by methods appropriate to the aquatic group using defined protocols.

## Results

The results discussed in the FY 2004 Monitoring Report have not changed for FY 2006.

### Findings

Inventories of benthic macroinvertebrate, crayfish and mollusk communities need to be accomplished.

21. What is the status and trend for pond game fish in relationship to management activities and habitat conditions (B-42 Amendment #2)?

### Information

This monitoring question is responsive to goals 1, 3, 4, 7 and 8. Throughout the Forest landscape, there is an ecologically sound distribution of aquatic communities.

- Sampling of game fish and water quality in established freshwater fish ponds annually across the Forest.

### Results

The results discussed in the FY 2004 Monitoring Report have not changed for FY 2006.

### Findings

There was no fish population or water quality monitoring conducted in 2006.

## **Sub-Issue 1.2 - Forest and Range Health**

22. How are insect and disease populations affecting goal/objectives attainment (B-3)?

### Information

This monitoring question is responsive to goals 1, 2, 3, 4, 6, 7 and 8. Decrease the susceptibility of forest stands to insects and disease by changing or avoiding ecosystem conditions that favor future insects and disease epidemics.

- Location and population trends of southern pine beetle, fusiform rust and annosum root rot

### Results

Southern pine beetle populations were at very low levels during 2006.

Findings

No additional action is needed.

23. Are National Ambient Air Quality standards for suspended particulate matter and ozone being met on the Francis Marion National Forest (B-18)?

Information

This monitoring question is responsive to goal 8 which is to maintain air quality.

- Compliance with NAAQS air particulate and ozone concentrations in the atmosphere [36 CFR 219.27(a)(12)]

Results

Prescribed fire on the Francis Marion National Forest continues to be the most important Forest Service activity impacting air quality since it releases fine particles into the atmosphere which can affect human health, safety and visibility conditions. In FY06, the amount of fine particulate matter released into the atmosphere by prescribed fire was slightly less than the previous year, reflecting the decrease in acres treated from 35,243 to 30,930 (Table 2-5).

The three monitoring sites closest to the Forest showed decreases in 24- hour and annual-average fine particulate matter concentrations from previous reporting years (Table 2-6). The National Ambient Air Quality Standards (NAAQS) for fine particulate (PM2.5) were not exceeded even with emissions from prescribed fire.

Prescribed fire also emits smaller amounts of nitrogen oxides which can contribute to increases in ground-level ozone. Motor vehicles also release nitrogen oxides. The two ozone monitors near the Forest continue to show levels well below the NAAQS, again demonstrating that Forest Service activities are not contributing to unacceptable levels of air pollution (Table 2-7).

**Table 2-5. Emissions of Fine Particulates (tons per year) from Prescribed Fire**

FY03	FY04	FY05	FY06
1142	867	972	850

**Table 2-6. Summary of Fine Particulate Matter (PM2.5)**

Location	Site ID	2004 24-hour 98 <sup>th</sup> percentile (ug/m <sup>3</sup> )	2004 Annual Average (ug/m <sup>3</sup> )	2005 24-hour 98 <sup>th</sup> percentile (ug/m <sup>3</sup> )	2005 Annual Average (ug/m <sup>3</sup> )	2006 24-hour 98 <sup>th</sup> percentile (ug/m <sup>3</sup> )	2006 Annual Average (ug/m <sup>3</sup> )	3-year Average 24-hour 98 <sup>th</sup> percentile (ug/m <sup>3</sup> )	3-year Average Annual Average (ug/m <sup>3</sup> )
Charleston Cty (north)	450190048	27	12.3	33	13.3	25	12	28.3	12.5
Charleston Cty	450190049	29	12.0	33	12.3	22	11	28	11.8
Georgetown Cty	450430009	28	12.5	33	13.7	25	13	28.7	13.1

The fine particulate standard is violated if the average of 3-years of annual means is 15 ug/m<sup>3</sup> or greater (multiple community oriented monitors can be averaged together), or the 3-year average of the 24-hour concentration for the 98th percentile (using the maximum population oriented monitor in an area) is the 35 ug/m<sup>3</sup> or greater. Source: <http://www.epa.gov/air/data/geosel.html>

**Table 2-7. Summary of Ozone Data from Monitoring Sites\***

Monitor Location	Year	Fourth highest 8-hour average	3 Year Average
Berkeley County	2006	0.064	0.069
Charleston County	2006	0.078	0.075

\* The ozone standard is violated at a site if the 3-year average of the fourth highest 8-hour average ozone concentration is 0.085 ppm or higher. Source: <http://www.epa.gov/air/data/geosel.html>

### Findings

Monitoring results for both of these pollutants indicate that air quality in the vicinity of the Forest is attaining the NAAQS.

Fine particulates can also reduce visibility. Data was collected at Cape Romain National Wildlife Refuge (located between the eastern boundary of the Forest and the Atlantic Ocean) for the visibility monitoring network, IMPROVE. The data cannot be used for NAAQS determinations, but they document the types of particulate that are found on the coastal side of the Forest. IMPROVE data confirms that sulfates constitute the largest portion of fine particulates on both clear and hazy days at Cape Romain (<http://vista.cira.colostate.edu/views/>). The majority of sulfates are emitted from electrical power generation facilities (VISTAS Emissions Inventory, <http://webcam.srs.fs.fed.us/emissions/>).

In September 2006, the Environmental Protection Agency (EPA) lowered the daily PM2.5 NAAQS from 65 to 35 ug/m<sup>3</sup>. The annual standard remains the same at 15 ug/m<sup>3</sup>. According to current language in the regulations, states will provide EPA with nonattainment area recommendations (for the new standard) by November 2007 using monitoring data from 2004-2006. EPA will issue the final nonattainment designations in November 2009, and the new nonattainment designations will be effective April 2010. Based on the data shown in Table 2-6,

it appears that all monitors around the Francis Marion National Forest will remain in attainment of the PM2.5 standards.

### **Sub-Issue 1.3 - Watershed Condition**

24. Are Forest streams in compliance with state water quality standards (B-21)?

#### Information

This monitoring question is responsive to goals 1, 3, and 8. The Forest's streams, lakes, wetlands, and riparian areas are healthy, functioning ecosystems that produce sustained flows of high quality water.

- Average annual water quality measured at monitoring stations on Turkey, Wambaw and Awendaw Creeks.

#### Results

A 2003 monitoring report (Plewa and Hansen) identified existing conditions of concern from excessive methyl mercury accumulations in certain fish species and fecal coliform in waters used for shellfish harvesting. Locally brackish waters may occur in the tidal influence zone and can be of concern.

Fish consumption advisories have been issued in the past for excessive amounts of mercury in certain fish species and for fecal coliform in waters used for shellfish harvesting. Elemental mercury is converted to the toxic methyl mercury form due to high sulfur, low pH and anoxic conditions common in wetlands. Certain organisms bioaccumulate methyl mercury in the food chain and high levels have been identified by researchers in organisms like mosquito fish. Methyl mercury becomes a major concern in game fish such as bowfin and large mouth bass where it can accumulate in tissue prior to human consumption. Essentially all the coastal black water streams with heavy contributions from wetlands are affected and the major rivers have fish consumption advisories in place.

Fecal coliform comes from a variety of sources of warm blooded animal and human waste. Specific sources are sometimes difficult to ascertain within the forest, and for most practical purposes would be difficult to control except for human inputs. Outside sources can be numerous and may include cattle, pets, faulty septic systems and recreational uses. The water quality standards associated with shellfish gathering waters along the coast indicate sensitivity to very low levels of fecal increase.

Research has begun within the Turkey Creek watershed and the Santee Experimental Forest to address many of the coastal water quality issues. The Francis Marion National Forest is cooperating in these studies with the USFS Center for Forested Wetlands. Recently, the Santee Experimental Forest was

selected to be included as part of the National Experimental Forest and Range (EFR) network to represent the coastal issues that are unique to the area. Mercury, fecal coliform, nutrients, carbon cycling and other issues are being addressed in a variety of project studies and research.

### Findings

Water quality data collection for the five year frequency was not done because of lack of funding. We should revisit the decision as to whether the monitoring is needed, needs adjustment, or whether we should consider other options for combining our efforts and needs with those being developed by the Southern Research Station on the Santee Experimental Forest and adjacent areas.

25. Is the Forest in compliance with State Best Management Practices (BMPs) (B-45 new)?

### Information

This monitoring question is responsive to goals 1, 3, and 8. The Forest's streams, lakes, wetlands, and riparian areas are healthy, functioning ecosystems that produce sustained flows of high quality water.

- Compliance with State BMPs.

### Results

BMPs were fully implemented and effective at protecting water quality, soil productivity and associated resources based on field checks of at least 5 units with streams or wetlands during 2006. No water quality or soil productivity problems were detected.

For 2004-2005, timber harvesting BMPs were implemented 100% of the time on the sampled timber sales. In 2006, BMPs were properly checked by the sale forester, administrator and/or inspector. Inspections and documentation were part of each sale record. Soil and water specialists also evaluated some areas for consistency.

A substantial amount of effort has gone into planning of prescribed burning, biomass, thinning, harvesting and other treatments to reduce soil impacts relative to compaction, displacement and rutting. Field conditions are being validated to insure that the sensitive soil types with high rutting potential are identified prior to treatments. Site-specific mitigation measures are in place to limit impacts and are being checked during project implementation BMPs are also being integrated into other ground disturbing resource activities.

BMPs were implemented on prescribed burning areas. Some of the prescribed burning issues are being addressed with the Southern Research Station (Wetlands Center). These efforts are being updated each year and continue to expand to

address pertinent issues relative to prescribed burning in the urban interface expansion boundaries of Mount Pleasant and Charleston, SC, and other smaller communities.

Bridge replacement and widening projects were reviewed at State Highways 41 (Turkey Creek) and 45 (Wambaw Creek). Concerns found in 2005 with excessive sediment and silt fences being inadequate were discussed with the SC DOT. Improvements were made and areas have stabilized in 2006.

Unauthorized (user-created) trails (primarily from OHV use) are causing soil and water related problems. User-created trails disturb sensitive areas such as vernal wetlands and cause rutting, soil displacement and impacts to vegetation. Some of these fragile areas have unique plants that are very sensitive to disturbance. Disturbed areas will grow in size as some trail users try to go around the highly disturbed areas.

The Forest and Districts are addressing many of the issues with the designated ATV trails, and this requires regular attention. They have improved monitoring and maintenance, provided wet weather trail closure and other structural and design trail improvements that are responsive to the needs of both resources and users.

#### Findings

The South Carolina Forestry Commission is being used more and more for BMP compliance checks and for quality control. A more formalized strategy will be needed on how to handle or mitigate specific types of unauthorized public use issues such as user-created trails. There are still some designated trail sections with resource impacts that may require some action (improvement, section relocation).

## ***Issue 2. Sustainable Multiple Forest and Range Benefits***

### **Sub-Issue 2.1 - Recreational Opportunities**

26. Are the acres of land greater than ½ mile from an open road increasing at a rate to achieve the objective (B-2)?

#### Information

This monitoring question is responsive to goals 1, 3, 7 and 8 and objective 3.

**Objective 3** is to increase the acres of land ½ mile from an open road or greater to 24,000 acres in this 10-year planning cycle. Road closure is emphasized in some areas of the Forest to enhance roadless area characteristics and to provide more semi-primitive recreational experiences. In addition, the Forest provides shelter and forage for a variety of neo-tropical migratory birds which can be enhanced by reducing open road density.

- Acres ½ mile from an open road and number of 250-acre blocks ½ mile from an open road.

### Results

No information was collected for FY 2006.

### Findings

An analysis done in FY 2000 determined that the objective would be met by the end of the ten-year planning cycle.

The next update of this information will occur in FY 2007.

27. Are the activities creating or maintaining the desired Recreation opportunity Spectrum ROS classes (B-12)?

### Information

This monitoring question is responsive to goals 3, 4, 6 and 8 and objective 6. **Objective 6** is to manage the following acreage to achieve the Recreation Opportunity Spectrum class conditions: rural (81,826 acres), roaded natural (126,219 acres), semi-primitive motorized (21,147 acres), and semi-primitive non-motorized (13,549 acres). Visitors enjoy a diversity of recreational opportunities.

- The condition of each ROS class.

### Results

No targeted information was collected in FY 2006. However, ongoing ROS classification review is done throughout the year in conjunction with regular site visits. No inconsistencies were found in FY 2006.

In FY 2000, specific ROS monitoring showed that management activities have created or are maintaining the desired ROS classifications. Several recreation areas were monitored, including areas within the semi-primitive ROS classifications.

### Findings

The next update of this information will occur in FY 2007.

28. What is the current use of recreational facilities and trails (B-13)?

Information

This monitoring question is responsive to goals 3, 4, and 8. The Forest is a popular place with a wide range of recreational visitors.

- Recreational visitor use of facilities/sites and trails.

Results

No information was collected this year.

Findings

The next update of this information will occur in FY 2008. The NVUM will be re-surveyed in fiscal year 2008.

29. Are the distribution, design, location, capacity and condition of the recreation facilities and trails meeting the needs of the users (B-14)?

Information

This monitoring question is responsive to goals 3, 4, and 8 and objectives 7 and 8. The Forest Plan has an objective (**Objective 7**) to increase the developed recreational facilities capacity to 2,200 people-at-one time (PAOT) within the next 10 years. Another objective (**Objective 8**) is to increase the trail system to 160 miles within the next 10 years. There are more opportunities for developed recreational activities.

- User satisfaction with facilities and trails

Results

An equestrian market study was completed for the entire Francis Marion and Sumter National Forests in 2006.

Results of this study indicate that:

- ✓ Coastal topography is less diverse for riders;
- ✓ Coastal weather is hot and humid;
- ✓ Trail tread preference is sand or soft dirt, not gravel; and,
- ✓ Forest Service is best suited for shorter day trail rides.

The conclusions of the study in order of priority:

- ✓ Improve program management at all facilities – cost for operation of facilities and better use/demand information;
- ✓ Continue trail maintenance; and,
- ✓ Continue day-use facility maintenance.

The recreation/trails program has been making a lot of infrastructure changes/improvements to the Wambaw Cycle Trail system over the past few years in an attempt to mitigate impacts to the natural resources around the trail (as well as improve trail experience so riders want to stay on the trail). Over the past six years, cycle trail improvements have included trail hardening signing and barriers. There is a grant through the Recreational Trails Fund (RTP) program to fence around 12 existing vernal ponds. Additionally, there is money available from the RTP grant funds for making more improvements and mitigating impacts from motorized trails.

### Findings

National Visitor Monitoring (NVUM) results indicate that the three items that forest visitor's stated needed to be improved the most were cleanliness of the restrooms, the availability of information on recreation, and the interpretive displays, signs and exhibits. Interim monitoring of satisfaction through surveys or other methods could also be employed as funds become available.

No visitor use trend information is available at this time. In 2008, NVUM monitoring will be completed again (five year cycle). At that time, there will be enough information to start developing trend information.

Improvements/modifications to trail infrastructure are not the only answer to resource impact problems. There should be a multi-faceted solution that includes periodic law enforcement checks, education/media campaigns/communication strategy (e.g. newspaper stories highlighting the issue) and trailhead and visitor center education through signing and using camp hosts.

30. Are the number of people-at-one time (PAOTs) and miles of trails increasing at a rate to achieve objective (B-15)?

### Information

This monitoring question is responsive to goals 3, 4, 6 and 8 and objectives 7 and 8. The Forest Plan has an objective to increase the developed recreational facilities capacity to 2,200 (PAOTs) within the next 10 years (**Objective 7**) and to increase the trail system to 160 miles within the next 10 years (**Objective 8**).

- Number of PAOTs of developed sites

- Number of miles of trails

### Results

The construction of the Awendaw Creek canoe and kayak ramp was initiated in FY 2006 and will be completed in FY 2007. Rehabilitation and enhancement of the Sewee Shell Ring interpretive trail and boardwalk is planned for FY 2008. A new interpretive trail is being considered for FY2008 also.

### Findings

No additional action is needed.

31. Are activities creating or maintaining the desired Visitor Quality Objectives (VQOs) (B-16)?

### Information

This monitoring question is responsive to goals 2, 3, 4, 6 and 8 and objective 10 of the Forest Plan which is to manage the following acreage to achieve the VQOs classes: modification (186,788 acres); partial retention (38,648 acres); retention (4,179 acres); and, preservation (13,812 acres). The landscape around most travel routes continues to be managed to reduce the visual impacts of activities that might be seen by a passer-bys. Generally, visual quality is improved.

- The condition of each VQO class.

### Results

No specific visual monitoring information was collected in FY 2006. However, ongoing visual review is done throughout the year in conjunction with regular field visits. No inconsistencies were found in FY 2006.

In FY 2000 specific visual monitoring showed that management activities have created or are maintaining the desired VQOs. Several projects were monitored.

### Findings

The next update of this information will occur in FY 2007. No additional actions are required.

## **Sub-Issue 2.2 - Land Adjustments**

32. Are lands being acquired which consolidate ownership, contain unique areas, enhance recreational opportunities, maintain public access and increase management efficiency (B-20)?

### Information

This monitoring question is responsive to goal 5. The Forest is more consolidated, and land acquisitions include an array of unique plant and animal habitats, riparian areas, geological features, cultural resources and unique recreational opportunities.

- Annual land adjustments.

### Results

No additional lands were acquired in FY 2006.

### Findings

Funding was not available for any purchase, but new purchases are planned in the future.

## **Sub-Issue 2.3 - Heritage Resources**

33. Are heritage sites protected (B-44 new)?

### Information

This monitoring question is responsive to goal 2. Manage, protect and perpetuate natural and cultural values associated with these irreplaceable resources.

Sample field condition assessment of sites eligible or listed on National Register.

The forest objective is to document and compare existing heritage resource conditions to the desired objectives through monitoring. Heritage resources include places such as archaeological and historical sites, and traditional cultural properties. Heritage resources also include things such as artifact collections, historic maps and records, and special or sacred objects. Heritage resources are vulnerable, nonrenewable resources and our goal is to preserve, protect, and interpret them for the public.

## Results

The Forest Service uses a sampling strategy to select priority heritage assets for monitoring. The results of this effort are presented in the table below.

**Table 2-8. Heritage Sites Monitored**

Total number of assets monitored	9
ARPA investigations	0
Assets eroding by water	1
Assets damaged by forest users	1
Assets damaged by forest management	0
Assets undisturbed	7

Monitoring identified natural threats to archaeological sites. The most serious damaged occurred on sites that are being eroded by maintenance and use of the Atlantic Intracoastal Waterway. In addition to natural threats, other priority assets have been damaged by unauthorized activities such as the use of off road vehicles other than on designated trails.

The full scope of archaeological site looting, vandalism, and other threats is not known due to the small sample of sites monitored. The use of metal detectors to dig for artifacts on historic sites is a growing concern.

There are two historic buildings and two fire lookout towers that are in need of repair, restoration, or documentation.

## Findings

The Forest continues to identify and monitor archaeological sites and historic buildings at risk. Heritage resource specialists are working with law enforcement, other Forest Service employees and the public to document and deter unauthorized forest activities that damage historic properties.

The forest needs to increase monitoring to determine the effects of unauthorized activities and uses on archaeological sites, including use of off road vehicles, horse trails, and woods roads. The effects of management activities such as tilling wildlife fields and constructing of firelines need to be evaluated as well.

Finally, the forest needs to develop Heritage Preservation Plans for at risk priority assets and implement a regularly scheduled monitoring program. The forest needs to assess its collections, including artifacts, photographs, and historical records, and develop a curatorial plan.

### Issue 3. Organizational Effectiveness

34. Are probable activities, costs and outputs occurring as estimated in the Plan (B-22)?

#### Information

Specific items have been tracked and are summarized in the following table. The Forest Plan established a range of acceptable results of within 20 percent of estimated projections.

- See tables below

#### Results

The following table shows the trend in various activities across the Forest

**Table 2-9. Activities and Expenditures/Outputs**

<b>Activity</b>	<b>Unit of Measure</b>	<b>FY04</b>	<b>FY05</b>	<b>FY06</b>	<b>10 year Plan Estimate</b>
<i>Road Construction</i>	<i>Miles</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>15</i>
<i>Road Reconstruction</i>	<i>Miles</i>	<i>6.3</i>	<i>1.7</i>	<i>36.7</i>	<i>63</i>
<i>Timber Roads</i>	<i>Miles</i>	<i>27.0</i>	<i>8.6</i>	<i>38.2</i>	<i>N/A</i>
<i>Roads Decommissioned</i>	<i>Miles</i>	<i>6.0</i>	<i>0.0</i>	<i>1.0</i>	<i>N/A</i>
<i>Open Roads</i>	<i>Miles</i>	<i>432.7</i>	<i>433.4</i>	<i>433.2</i>	<i>446</i>
<i>Closed Roads</i>	<i>Miles</i>	<i>127.2</i>	<i>131.0</i>	<i>131.0</i>	<i>172</i>
<i>Maintained Permanent Wildlife Openings</i>	<i>Acres</i>	<i>720</i>	<i>720</i>	<i>720</i>	<i>810</i>
<i>Covert Loblolly to Longleaf</i>	<i>Acres</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>7,700</i>
<i>Establish Regeneration</i>	<i>Acres</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>16,150</i>
<i>Fertilization</i>	<i>Acres</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>600</i>
<i>Intermediate Stand Treatments</i>	<i>Acres</i>	<i>0</i>	<i>2,000</i>	<i>4,223</i>	<i>22,500</i>
<i>Regeneration Harvest</i>	<i>Acres</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>3,600</i>
<i>Thinning Harvest</i>	<i>Acres</i>	<i>983</i>	<i>2,280</i>	<i>3,736</i>	<i>44,000</i>
<i>Volume offered for Sale</i>	<i>MMCF</i>	<i>0.8</i>	<i>2.6</i>	<i>6.2</i>	<i>33</i>
<i>Winter Season Prescribe Burning</i>	<i>Acres/Year</i>	<i>24,426</i>	<i>23,381</i>	<i>19,521</i>	<i>26,000</i>
<i>Growing Season Prescribe Burning</i>	<i>Acres/Year</i>	<i>7,110</i>	<i>11,862</i>	<i>11,409</i>	<i>4,000</i>
<i>Annual Payments to Counties</i>	<i>M\$</i>	<i>908</i>	<i>929</i>	<i>938</i>	<i>68</i>
<i>* Annual Budget</i>	<i>MM\$</i>	<i>13.6</i>	<i>10.8</i>	<i>10.2</i>	<i>N/A</i>

\* The budget allocation includes both the Sumter and Francis Marion National Forests and cannot be tracked separately. Annual Budget expenditures are adjusted for inflation and do not include any dollars allocated for grants and other specific programs. Timber roads are those roads under timber sale contract. Permanent wildlife openings do not include maintained linear wildlife strips.

## Findings

Factors such as uncertain weather, budget and staffing constraints, increasing urbanization, and smoke sensitivities will have an effect on the ability to sustain or significantly increase the acres burned. Stewardships and other types of partnerships are being used and need to continue to be used to maintain critical ecosystem components and control hazardous fuels.

The Francis Marion road system continued to receive heavy use by the public and commercial users. Emphasis continues on maintaining and reconstructing roads to meet the objective maintenance level, meet current design standards and best management practices, and reduce negative impacts to resources with the focus on watershed health. Road projects to support timber activities continue to focus on surface and culvert replacement. No new miles of road were constructed in FY 06.

The Forest's new road construction miles continue to be much lower than the target projected in the plan. The availability of additional funding from Knutson-Vandenberg Trust Fund special legislation allowed the forest to surface, reconstruct, and maintain a significant mileage above the last few years. These dollars were focused on the newly acquired tracts and adjacent existing roads.

The Forest has not been able to close any significant mileage of roads to reach the percentage of closed roads in the plan. However, the total mileage of roads on the forest is nearly ten percent (10%) below the mileage projected in the plan.

The Francis Marion has continued to conduct road condition surveys to determine the condition of the road system and the amount of deferred maintenance. The FY 06 survey focused on forest primary open roads classified as maintenance level 3, 4 and 5. The deferred maintenance on these 389.1 miles of open road was estimated at \$13,786,688. The Forest decommissioned one (1.0) mile in FY 06 from the existing system. The forest will be looking to shift some road miles into a lower maintenance level in future years due to reduced maintenance budgets.

**Table 2-10. Status of Recreational Facilities, Trails and PAOTs**

<b>Activity</b>	<b>Unit of Measure</b>	<b>FY03</b>	<b>FY04</b>	<b>FY05</b>	<b>FY06</b>	<b>10 year Plan Estimate</b>
<i>Construct Boat Ramps</i>	<i># of Sites</i>	0	0	0	0	2
<i>Construct Horse Camps</i>	<i># of Sites</i>	0	0	0	0	1
<i>Construct Campgrounds</i>	<i># of Sites</i>	0	0	0	0	1
<i>Construct Canoe Access</i>	<i># of Sites</i>	0	0	0	0	5
<i>Construct OHV Trails</i>	<i>Miles</i>	0	0	0	0	20
<i>Construct Bicycle Trails</i>	<i>Miles</i>	7	0	0	0	10
<i>Construct Canoe Trails</i>	<i>Miles</i>	0	0	0	0	10
<i>Construct Hiking Trails</i>	<i>Miles</i>	7	0	0	0	10
<i>Construct Horse Trails</i>	<i>Miles</i>	0	0	0	0	20
<i>Recreation Capacity – Boat Ramps</i>	<i>PAOTs</i>	230	230	230	230	500
<i>Recreation Capacity – Horse Camps</i>	<i>PAOTs</i>	0	0	0	0	50
<i>Recreation Capacity – Campgrounds</i>	<i>PAOTs</i>	280	280	250	250	400
<i>Recreation Capacity – Canoe Access</i>	<i>PAOTs</i>	0	0	0	0	130
<i>Recreation Capacity – Other</i>	<i>PAOTs</i>	790	790	790	790	1,165
<i>-Trails, total</i>	<i>Miles</i>	166.1	166.1	166.1	166.1	160.5
<i>-OHV</i>	<i>Miles</i>	40	40	40	40	60
<i>-Bicycle</i>	<i>Miles</i>	63	63	63	63	10
<i>-Canoe</i>	<i>Miles</i>	35.8	35.8	35.8	35.8	22.5
<i>-Hiking</i>	<i>Miles</i>	57.3	57.3	57.3	57.3	30
<i>-Horse</i>	<i>Miles</i>	33	33	33	33	38

39. Are projects being managed according to requirements and making progress toward achievement of DFC for vegetation (B-46 new)?

Information

This monitoring question is responsive to goals 1, 2, 3, 6, 7 and 8.

- Do an Integrated Resource Review (IRR).

Results

No Integrated Resource Reviews (IRRs) were completed in FY 2006.

Findings

An IRR is proposed to be completed in FY 2008.

## Chapter 3. FY07 and FY08 Action Plan and Status

### Actions Not Requiring Forest Plan Amendment or Revision

**a) Action:** Inventory and then develop a monitoring program for aquatic macroinvertebrate communities across the Francis Marion National Forest, including aquatic insects, crayfish and mollusks.

**Responsibility:** Districts and SO staffs.

**Date:** FY 2006 and FY 2007

**Status:** Crayfish and mussels were collected in conjunction with the fish community monitoring in FY 2003.

**b) Action:** Emphasis needs to be placed on efforts to bring the Regional database into operational use for estimating forest-wide trends related to compiling and analyzing bird point or harvest data for MIS species, including Northern Bobwhite, Eastern Wild Turkey, Painted bunting, American swallow-tailed kite, Prairie Warbler and Northern Parula.

**Responsibility:** SO staff.

**Date:** FY 2008

**Status:** Data has been entered and analysis can be done at the Regional and Forest level but information is currently not available at the District level. No further action will be taken. Emphasis will be placed on getting access to the information by Districts to use in project planning.

**c) Action:** The Forest needs to begin doing even-aged regeneration harvesting in order to meet Objective 12 and begin providing additional habitat for maintaining viable populations of early successional native species.

**Responsibility:** District staff.

**Date:** FY 2008 and FY 2009

**Status:** Planning has begun on the first longleaf restoration project since Hurricane Hugo. Analysis of excess foraging habitat for RCW has been completed. Forest stands have been identified that could be regenerated to longleaf pine. The next step will be to begin NEPA scoping and environmental analysis in FY 2008 on the Honey Hill Habitat Restoration Project.

**d) Action:** Increase the active management (i.e., prescribed burning, thinning) in the Wando area of the Forest in order to recover the flatwoods salamander and to prevent listing of the Carolina Gopher frog.

**Responsibility:** District staff.

**Date:** FY 2006 and FY 2007

**Status:** The 2,864 acres of biomass thinnings in the Wando-Ion area were sold in 2006. Re-establishment of a frequent prescribed fire regime is still needed. Critical habitat for flatwoods salamander was proposed by the United States Fish and Wildlife Service in FY 2007.

**e) Action:** Use certain percentages in the satisfaction chart from NVUM to measure if our recreation programs, facilities and settings are meeting the needs of our customers. After the 2008 NVUM, there will be some trend information to compare with 2002 data. We expect that some of our lowest rated items will have improved. At that time, develop actions to address the lowest rated elements.

**Responsibility:** SO staff.

**Date:** FY 2009

**Status:** Presently using PAOTs to measure accomplishment for recreation capacity.

#### **Actions That Require Forest Plan Amendment or Revision**

**a) Action:** Prepare a Forest Plan amendment, as necessary, to modify FW-83 or Appendix A regarding items which are inconsistent with the new Recovery Plan for RCW.

**Responsibility:** SO planning and resource staffs.

**Date:** FY 08

## Appendices

### ***Appendix A - List of Preparers***

The following individuals contributed to this report:

Jim Bates	Forest Archaeologist
Bill Hansen	Hydrologist
Ed Hedgecock	Forest Engineer
John Cleeves	Forest Planner
Dennis Law	Soil Scientist
Robert Morgan	Archaeologist
Gary Peters	Wildlife Program Manager
Robin Mackie	Ecologist/Botanist
Mae Lee Hafer	Resource Staff Officer
Stephen Wells	Fire, Lands and Minerals Staff Officer
Tony White	Planning, Engineering, Recreation, and Heritage Resources Staff Officer
Joe Robles	Recreation Specialist
Robbin Cooper	Landscape Architect
Jay Purnell	Forest Silviculturist
Charlie Kerr	Fire/Aviation Management Officer
Joel Harrison	Forest GIS Coordinator
Cindy Huber	Air Specialist
Jeanne Riley	Fisheries Program Manager

## ***Appendix B - Amendments to Forest Plan***

Amendment 1, October 2002 - This amendment provides direction for the preparation of site-specific Biological Evaluations (BE) including inventory requirements for Proposed, Endangered, Threatened, and Sensitive (PETS) species. The amendment makes the process of conducting BEs more efficient and consistent throughout the Southern Region of the Forest Service.

Amendment 2, May 2003 - This amendment revises the Management Indicator Species (MIS) List to increase efficiency and effectiveness of the Forest's monitoring program and project effects analyses.

Amendment 3, December 2004 - This amendment adds a standard to the Forest Plan that is needed to incorporate newly acquired lands into the Forest Plan and begin managing these lands through site specific projects.

## ***Appendix C - Summary of Research Needs***

The following research needs have been identified for rare species.

- What is the distribution of American eel across the Forest? What habitat does the eel utilize? What is the population status?
- What species of crayfish occur on the Forest and what is the distribution of crayfish across the Forest? What is the population status?
- What species of mollusks occur on the Forest and what is the distribution of mollusks across the Forest? What is the population status?
- What ecological factors are affecting the health of the federally-endangered pondberry at Honey Hill? How can this population best be managed?
- What ecological factors are affecting the health of the federally threatened flatwoods salamander on the forest? How can this population best be managed?

# FRANCIS MARION NATIONAL FOREST FISCAL YEAR 2006 MONITORING AND EVALUATION ANNUAL REPORT

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I have the following comments on the Monitoring and Evaluation Annual Report:

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