

2008
Monitoring and Evaluation Annual
Report

Revised Land and Resource Management
Plan

Sumter National Forest

September 23, 2009



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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, Sumter National Forest* (Forest 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/Paul Bradley
PAUL BRADLEY
Forest Supervisor

9/23/2009
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 Sumter National Forest will be managed. Monitoring is used to assess how well goals and objectives are being met, if standards and guidelines are being properly implemented, and whether environmental effects are occurring as predicted. A Summary of Key Results and Findings are listed below.

Ecosystem Condition, Health and Sustainability

Woodlands - It is estimated we will establish about 3,000 acres of woodlands in the piedmont, and less than 1,000 acres on the Andrew Pickens. Early successional habitat, particularly woodland/savanna habitat is in short supply across all districts of the Sumter National Forest. Progress has been made in recent years with establishment of woodlands and savanna habitat on all districts.

Oak-Pine forest - Thinning loblolly pine stands will allow sunlight to reach the forest floor and should stimulate advanced regeneration of oaks and hickories (Objective 8.03). We are thinning over 2,000 acres/ year on the Sumter, which will contribute towards meeting this objective in the long-term. Hard mast species are retained during regeneration activities including site preparation.

Restore Shortleaf Pine - On the Andrew Pickens Ranger District, the objective is to restore native communities on sites occupied by loblolly pine on 2,000 - 6,000 acres. Currently about 870 acres of loblolly pine have been converted to shortleaf pine. An AP loblolly pine removal EIS being planned in FY09 will contribute towards meeting the rest of this objective.

The objective of restoring shortleaf pine communities (Objective 8.04) is unlikely to be fully achieved in the piedmont during the planning period because the areas of adequate soil conditions are operationally too small to be converted. Past erosion has generally left such soils in very few places. The areas found thus far tend to be very small, isolated parts of certain ridges or flats.

Canopy Gaps/Hardwood hard mast- The Andrew Pickens Ranger District is proposing a project to meet Objective 8.05. A project specifically designed to create canopy gaps and enhance hardwood hard mast for wildlife is in the planning stages.

White Pine Removal - No projects have been implemented to meet Objective 8.06. Restore more diverse native communities on 1,000 - 2,000 acres currently occupied by white pine stands. The Andrew Pickens has focused on loblolly pine removal.

MIS - Declines in MIS populations in the Southern Blue Ridge physiographic area reflect lack of open pine stands and dense midstory and understory canopies. Canopy gaps and understory treatments that include use of prescribed fire are needed to maintain and develop desired

conditions. Increases in some bird counts are likely due to large forested blocks where oaks are common.

Declines in MIS populations in the Southern Piedmont physiographic area reflect the overstocked conditions in pine forests. Even though prescribed burning is fairly widespread across the piedmont, high stand densities and lack of canopy gaps are preventing desirable understory shrubby layers from developing.

Wetland habitat development and hardwood restoration activities need to be incorporated into vegetative management projects and other activities on the Forest. No assessment of hard mast has been done across the Forest. Extensive hardwood habitat is found along riparian areas.

Large Snag Habitat - Pileated woodpeckers are a primary indicator of large snag habitat. They also are a good indicator of older forests that have mixtures of live hollow trees and dead trees. Technical Report *Population Trends and Habitat Occurrence of Forest Birds on Southern National Forests, 1992-2004* (General Technical Report NRS-9) indicates the mean observations per count for pileated woodpeckers are increasing on the Andrew Pickens Ranger District and declining on the two Piedmont Districts. The increasing trend in the mountains most likely reflects the large number of pine snags that were created during past southern pine beetle outbreaks from 2001- 2003. Larger dead trees and older forest habitat on the two Piedmont Districts are in short supply and mainly occur in riparian areas.

Aquatic Community/Habitat- Eighteen streams have been inventoried for fish across the mountains, and repeated samples have been conducted in nine of those streams. Twenty nine fish species have been captured across the Andrew Pickens Ranger District. The fish species diversity of the Management Indicator Community in the Chattooga River watershed has not changed in more than 20 years of sampling the main stem of the river. Brook trout populations are considered stable in two recently restored streams. Three mussel species were sampled in the Chattooga River watershed on the Andrew Pickens Ranger District. No mussel species were found in the Chauga River watershed. Three mussel species were sampled in the Broad River watershed on the Enoree Ranger District. Aquatic insect surveys were conducted in the Chattooga River watershed in October 2007 and September 2008. Results will be available in 2009. No crayfish surveys were conducted in 2008. There were no aquatic habitat surveys conducted in 2008. There were no habitat improvement projects implemented in 2008.

Smooth Coneflower and small whorled pogonia - In 2008, monitoring of the ten populations for the federally endangered smooth coneflower (*Echinacea laevigata*) on the Andrew Pickens RD, including one new population of approximately 200 rosettes, was conducted by FS and SCDNR personnel. Monitoring of the three populations for the federally threatened species small whorled pogonia (*Isotria medeoloides*) on the Andrew Pickens RD was also conducted. . Total numbers for both smooth coneflower and small whorled pogonia plants showed an increase on the Forest in 2008.

Georgia Aster - Monitoring of eight populations for the federal candidate for listing Georgia aster (*Symphotrichum georgianum*) continued on the Enoree RD in 2008, and a management plan was developed which involved both Enoree and Long Cane Ranger Districts. A new population for Georgia aster, comprised of over 1500 plants, was discovered on the Enoree RD

by FS personnel. Within the management plan over 1000 acres in woodland restoration areas (>10 acres) were identified in proximity to known population locations, and population objectives, desired conditions for these areas, and management activities and timeframes needed to achieve desired conditions were identified.

Florida Gooseberry- The Forest Service monitored the one federally threatened Florida Gooseberry on the Long Cane RD and worked with the U.S. Fish and Wildlife Service in completing the 5-year status review for the federally endangered Florida gooseberry (available at [http://www.fws.gov/southeast/5yearReviews/5yearreviews/Miccosukee Gooseberry.pdf](http://www.fws.gov/southeast/5yearReviews/5yearreviews/Miccosukee%20Gooseberry.pdf)) The Florida gooseberry population on the Forest is stable.

Bobwhite Quail- Every year since 1988 the South Carolina Department of Natural Resources (SCDNR) has conducted the Bobwhite Quail Hunter Survey. The purpose of the survey is to collect quantitative information on hunter success which aids biologists in tracking quail population trends. The 2007-2008 survey shows that hunters flushed an average of 0.58 coveys per hour. This is not significantly different from the 2006-2007 season. From 1988 to present, there has been a steady decline in coveys found per hour. Bobwhite quail numbers continue to show declines statewide but appear to have stable to upward trends on portions of the piedmont on the Enoree and Long Cane Ranger Districts. Stable to upward trends for quail habitat on the piedmont likely reflects fire-maintained forests. Early-successional habitat woodland habitat is being developed but is still less than one percent on the Districts. Continued emphasis needs to be placed on thinnings, woodland habitat creation, regeneration harvest, and use of prescribed fire.

White-tailed deer- White-tailed deer harvest estimates continue to be relatively stable from previous years.

Turkey - According to the SCDNR's "2008 South Carolina Turkey Harvest Report," 15,118 adult gobblers and 2,186 jakes were harvested statewide during the 2008 Spring season (total harvest of 17,304). This is an 8.9 % decrease from the 2007 season. This decrease in harvest is attributed to poor reproduction. Despite the reduced harvest, the number of turkey hunters in 2008 increased 8 % over 2007. Turkey populations have declined in both the Southern Blue Ridge and Southern Piedmont physiographic regions. Key habitat components for the species are mature hardwood bottoms, scattered openings, and open uplands that are maintained with prescribed fire. Early successional habitat including woodlands is in very limited supply across the Districts. Turkey populations are closely associated with brood-rearing habitat. As with quail, turkeys will benefit from projects that increase early successional woodland habitat, thinnings and prescribed fire that keep understories open. This should improve and increase brood-rearing habitat as well.

Black bear - Black bear occur in the upstate counties of SC. Bear population are increasing and their range is expanding. During the 2008 season, 46 bears were harvested. This number represents the fourth highest harvest since 1970. Black bear habitat has tripled in the mountains and the population is increasing. Emphasis should be placed on developing and maintaining escape cover for black bear. Mast-producing hardwood restoration activities need to be incorporated into vegetation management projects on the Districts. The upward trends of black

bear and its habitat reflect the amount of mature to old habitat on the Andrew Pickens Ranger District.

Fishing ponds - There are 11 recreational fishing ponds totaling 89 acres on the Sumter National Forest. Largemouth bass and bream are the primary fish in the ponds. Ponds are periodically monitored to determine fish population and water quality conditions.

Forest Health

Prescribed Burning - In 2008, a total of 18,952 acres were treated with prescribed fire on the Sumter. This is a decrease from the 2007 total of 26,276 acres and reflects a 28 % decrease in total acres burned. Prescribed burning on the Forest in 2008 was short of the annual objective of 23,600 acres per year set by the Forest Plan. This shortfall was created by continuing drought conditions that pushed weather/fuel parameters outside prescription limits, limiting the number of burn days. All three Districts shared personnel and equipment to help achieve this forest-wide objective. The forest-wide objective is likely achievable in the future even with the additional complexity of burning and smoke management issues. Also, the fire organization for the Sumter has been reorganized in an effort to be more productive and efficient.

The number of acres in condition class 1 is increasing because of increased prescribed fire use and non-commercial and commercial mechanical treatments of forest stands. Stewardship contracts and timber sales are providing more opportunities for treating fuels than existed a few years ago. Estimates for the amount of condition class 1 lands have been made using existing stand data (CISC) for the Forest. The estimate indicates that approximately 14 % of the Forest is currently in condition class 1.

Air Pollution - The two main activities that cause air pollution within the Sumter National Forest are motor vehicle use and prescribed fires. Both of these activities emit pollutants that can increase ozone and fine particulate matter concentrations. During 2009, the Sumter National Forest conducted prescribed fire on 18,905 acres, and estimated fine particulate matter emissions from those fires are 624 tons. The breakdown of prescribed fire within each ranger district is as follows:

- *Andrew Pickens RD.* 1,963 acres burned, with an estimated 65 tons of particulate matter emissions released.
- *Enoree RD.* 7,904 acres burned, with an estimated 261 tons of particulate matter emissions released.
- *Long Cane RD.* 9,038 acres burned, with an estimated 298 tons of particulate matter emissions released.

Particulate Matter. According to one monitor located near the Long Cane Ranger District both the 24-hour and the annual fine particulate matter air quality standard are being violated. Although this area is not currently designated as non-attainment with the NAAQS, it may be in the future.

Despite that measured concentrations of fine particulate matter near the Long Cane Ranger District are above the air quality standard, other monitoring sites nearby are not experiencing elevated concentrations. Fine particulate matter concentrations near the Andrew Pickens and Enoree Ranger Districts are also not elevated. Therefore, at this time it is assumed that fine particulate matter concentrations on the Sumter National Forest are not causing negative impacts to visitors nor causing significant harm to visibility within the Forest.

Ozone. While fine particulate matter concentrations near the Forest generally meet air quality standards, ozone concentrations are elevated and do not meet the newly promulgated National Ambient Air Quality Standard for this pollutant. Negative impacts to vegetation within the Forest may be occurring. Non-attainment designations for ozone will occur in 2010, and it is likely that most, if not all, of the Sumter National Forest will fall into ozone non-attainment. Coordination between the Forest and SC DHEC will be necessary to ensure that emissions from prescribed fires are included in the State Implementation Plan (SIP) to improve ozone concentrations throughout the area.

Each District of the Forest has at least one nearby monitoring site that shows elevated ozone concentrations. Although none of these areas are currently designated non-attainment with the ozone standard, it is very likely that each of these areas will be part of a non-attainment area once the Environmental Protection Agency makes their final designations with the new ozone standard. Designations are expected to take place by March 2010. Because ozone levels are elevated at monitoring sites close to all ranger districts within the Forest, negative impacts to both human health and vegetation may be occurring.

Invasive Plant Control - Infestations of non-native, invasive plants are very high on the two piedmont districts, where the majority of stands are infested with at least one non-native invasive plant species. On the Andrew Pickens RD, invasive plant populations were documented along roadsides and the fish hatchery adjacent to the Ellicott Wilderness (Gaddy, 2008). Many areas on the Andrew Pickens RD are invasive plant-free.

The Sumter National Forest treated 872 acres of non-native invasive plants in 2008, including 402 acres on the Enoree, 325 acres on the Long Cane, and 145 acres on the Andrew Pickens. On the Enoree and Long Cane, treatments occurred primarily in uplands. On the Andrew Pickens, 105 acres of treatment occurred within the Chattooga Wild and Scenic River corridor whereas 40 acres occurred along roadsides. The reporting database for treatments is FACTS.

Enoree: Monitoring of kudzu treatments on the Enoree RD has suggested that more effective herbicides were needed in order to achieve control of kudzu, so a new Forest-wide NEPA decision was signed in 2008 to address use of alternative herbicides for treating kudzu and other invasive plant species on an additional 5000 acres of land and to allow for treatments on adjacent private lands with landowner permission under our Wyden Amendment Authorities.

Andrew Pickens: Control of Chinese privet has been achieved on the Garland (340 acres) and Back 90 tracts (45 acres) on the Andrew Pickens, though monitoring suggests that

autumn olive is beginning to invade one section of the Garland tract. Control of autumn olive, Chinese privet, and other non-native invasive plant species is ongoing within sections of the Chattooga River Corridor and Norton fields which border the Tamassee Creek Botanical/Zoological Area.

Watershed Condition and Riparian Areas

Timber harvest activities are monitored by sale administrators and inspectors to ensure the implementation and effectiveness of erosion control and water quality protection measures. Contract language is consistent with the intent of BMPs. Field inspections during activities and a final review are required of all measures upon sale closure. The inspection forms are included with the other sale documentation collected.

An agreement with the SC Forestry Commission (SCFC) has been formalized to conduct BMP checks and determine consistency when requested. In addition, interaction and cooperation to address non-point source pollution and BMPs are part of the Memorandum of Understanding with the SCFC, SC Department of Health and Environmental Control and the USFS. We need to renew and update the MOU content. The SCFC continues to provide group training of forest and technical staff on BMPs when requested. BMP compliance checks by the SC Forestry Commission on areas with ground disturbance or streamside management have been developing into a regular activity.

In 2008, a total of 67 acres were treated to improve soil and water conditions. This included 35 acres of gully restoration including site reshaping and erosion control, 25 acres of closing and stabilizing user created trails, three acres of streambank stabilization and four acres of native grass enhancement for seed production for erosion control and soil recovery needs. Native grasses are used for erosion control on treated gullies, trails and other exposed areas. This level of implementation is somewhat below the plan level indicated in Objective 1.01 of 1,500 acres over a decade. The 67 acres of soil and water improvements under Objective 1.01 was only 46% of the 150 acre annual average needed to meet plan direction.

A total of 791 acres of severely eroded, low site lands in poor watershed condition were fertilized including 45 acres of soil and water improvement (NFVW) funding and 746 acres of sale area improvement (CWKV) funding. All areas were reviewed and/or sampled in the field prior to treatment to be sure that they met the criteria for needing fertilization. The annual treatment amount of soil productivity improvements is on track and close to the planned level of 8,000 acres over a decade.

There were no accomplishments in 2008 toward developing a protocol process to work on reaching objective 2.01 relative to determining instream flow needed to protect streams, habitats, recreation and aesthetic values. No funding was allocated to this task or to get started on the protocol for determining in-stream flows. However, substantial effort was made to address sand mining and bank instability issues within Broad River.

In 2008, there was some progress toward treatment of 25 acres of ATV and associated unauthorized ground disturbing uses. Due to continuing problems with user created trails, there

is an ongoing backlog of work that may be increasing in extent and severity. We will continue to work toward closing, stabilizing and/or treating illegal trails within a year of their being found, but improved funding and other mechanisms may be needed to achieve this. Currently the extent of the problem remains poorly inventoried, rapidly changing and growing. System trail maintenance has increased and new trails are better designed.

OHV Trails are closed for wet weather or other damaging conditions. Temporary or seasonal closures are producing benefits to trail quality and reducing environmental impact and maintenance costs. Many of the horse trails are not receiving the same attention and have issues with user-created design, wet soil damage, lack of maintenance and our inability to monitor effectively.

Assessment of riparian condition is typically made during project planning. Work proposed in riparian corridors was ancillary to vegetation treatments in upland areas. Occasionally the riparian condition is evaluated and actions initiated to address riparian health and function. Some of these analyses address the presence of unwanted exotic species, lack of woody debris, active erosion from slopes, gullies, unstable or eroding streambanks, excessive sediment, fecal coliform, damage from unmanaged recreational uses, or a desire to restore certain types of native species, such as cane.

Riparian identification, delineation, functions and values are considered in field assessments. Activities are often adjusted, reduced or eliminated in response to the resources within these areas. Issues brought forward such as invasive species, undesignated or user created trails, camping, areas affected by actively eroding hillslopes or channels, and associated resource damages are being evaluated for appropriate response. Continuing integrated interaction and periodic review of field implementation of the riparian guidance and prescription is desired. Current riparian conditions need to be more formally assessed in conjunction with upland vegetation treatments and, where possible, integrate riparian treatments integrated into project design. There was no inventory of riparian areas in 2008. No specific projects were implemented in 2008 to create dense understory conditions or improve/restore structural diversity and composition within riparian corridors.

Recreational Opportunities

The first National Visitor Use Monitoring (NVUM) survey was completed on the Forest in FY 02. Refer to the 2004 Sumter Monitoring Report for the results of the 2002 National Visitor Use Monitoring of the Francis Marion and Sumter National Forests. A new round of visitor use monitoring was conducted on the Forests in FY 2008. The results of the monitoring will be available at the end of FY 2009. The 2002 and 2008 NVUM surveys will be used to begin to establish trends in recreation on the National Forests. Results should be available in the FY2009 monitoring report.

Wet weather closures on OHV trails continue to work well and are serving to mitigate much of the impact these trails have on riparian areas and other areas on or adjacent the trails. The policy of closing OHV trails during wet weather conditions has reduced impacts on riparian areas and other natural resources as well as the trail facility itself.

Trail maintenance continues to be a high priority for the recreation program on the Forests and is funded annually through appropriated, recreation fee, and grant dollars (the latter is used almost exclusively for maintaining/reconstructing OHV trails to increase financial and environmental sustainability). We continue to find ways, like using volunteer work days and hosts, to leverage our limited resources while reducing the impacts associated with OHV activities. Increased emphasis on trail maintenance across the Sumter is paying off. Many of the trails are in the best condition they have ever been in.

Project and field review of ground disturbing activities for SIO standards and ROS objectives are ongoing. Proposed projects on the Sumter National Forest met the established SIO standards and ROS objectives.

Roadless Areas/Wilderness/Wild and Scenic Rivers

A bio-physical impact inventory was completed in FY 07 for the Chattooga Wild and Scenic River. The inventory documented the miles of designated and user-created trails and the number of sites along the trails with erosion problems. Information about current use levels and future trends was also collected and compiled in FY07 for the Chattooga Wild and Scenic River corridor as part of the Chattooga River Carrying Capacity Analysis. More detailed information is available in the report entitled "*Capacity and Conflict on the Upper Chattooga River – An Integrated Analysis of 2006-2007 Reports*" (Whittaker and Shelby, 2007). The findings of the bio-physical inventory indicate that visitor use impacts are occurring. However, at this time outstandingly remarkable values are not being negatively affected.

Free flowing conditions and outstanding remarkable values are being protected on eligible wild and scenic rivers on the Sumter National Forest.

The forest plan and past monitoring have identified issues of elevated fecal coliform beyond standard levels in the lower portions of the Chattooga River, below Stekoa Creek. The Chattooga Coalition has expanded their sampling of the problems, working with City and County officials in their ongoing efforts to collect fecal coliform data within Stekoa Creek and disseminate information to the public. A National Forest Foundation grant for some of this work is extending the work into the lower Chattooga River below Stekoa Creek.

Since most of the eligible rivers have little monitoring information available, they are data poor as far as water quality. However, the eligible rivers are primarily forested, with low road, agricultural and development densities. There is no significant reason to believe that they are outside the normal expectations for wildland water quality standards.

Additional water quality data could be used to help establish water quality benchmarks or references. Indirect measures could be used such as land use and in-stream evaluations to detect changes in land uses or activities within the watersheds that might signal added monitoring of conditions is needed. Other surrogates such as aquatic macroinvertebrates could be used to address change or conditions. The need to acquire information before activities are proposed or occur within these watersheds from outside sources is important to consider.

We have been relying heavily on the assumption that these areas are dominated by National Forest. Forest management activities are stewardship and conservation oriented and generally not major pollution sources that impact water quality, but may contribute as a secondary source of pollutants. We are not aware of any conditions on these rivers where existing problems are already above threshold levels or listed as impaired streams. If we thought any of these areas were headed in that direction or had large expansions in activity levels, added evaluation may be needed. The eligible rivers were selected in part because activities have not caused irreparable change and water quality conditions are generally considered of high quality due to the prevalence of forest conditions. Road density and other ground disturbing practices remain relatively low. The forest and districts will continue to estimate and evaluate proposals for their impact to water quality including assessing impacts to the existing and eligible wild and scenic rivers.

Issues with unauthorized trails of one type or another and camping are increasing, especially near some streams. Where these activities are occurring within designated or eligible wild and scenic rivers, increased attention, monitoring and mitigation are needed. Some of these uses are being evaluated in the upper Chattooga River watershed capacity analysis. If these activities were increasing into the other eligible rivers, added concern and monitoring would be warranted.

Even on designated trails, equestrian uses are also locally causing resource damage that needs ongoing maintenance. User-created trails are creating resource issues because they are not properly located, designed, managed or maintained, and they have had no formal cultural, biological or other resource analysis.

The Forest and Districts are actively involved with addressing the issues at hand and complying with BMPs and Forest Standards. A more formalized strategy may be needed on how to handle, limit and/or mitigate specific types of public use issues that are unauthorized and/or causing resource damage. More effort needs to be placed when activities are proposed on private lands, to insure that the water quality and other values are considered.

Heritage Resources

Vandals and artifact collectors continue to use metal detectors to search historic sites and remove artifacts. Holes dug resulting from metal detector use were found at the historic house site 38NE38 on the Enoree Ranger District. A prehistoric lithic scatter site was an unanticipated discovery in areas logged in the Mingo Analysis Area, Compartment 355, Long Cane Ranger District.

Several sites are being damaged by water erosion along the shoreline of the Strom Thurmond Lake on the Long Cane Ranger District. Unauthorized use of woods roads, ATV use, horseback riding and bike trails are causing erosion and disturbance on sites. Site 38CS167 was disturbed by use of a woods road on the Enoree Ranger District. The access road to 38CS124 on the Enoree District was blocked to protect the Woods Family Cemetery. Eight fire lookout towers are historic sites in need of repair, restoration and documentation. Metal detecting and digging for artifacts on historic period sites continues to be a concern.

The Forest needs to develop Heritage Preservation Plans for at risk sites and implement regularly scheduled monitoring. Plowed wildlife openings should be inventoried for heritage resources and any significant sites found should be protected. A Forest Heritage Curation Plan should be developed to assess curatorial needs. The effects on archeological sites due to dispersed recreation should be assessed. Site management plans should be written for priority heritage assets and significant threatened sites.

Organizational Effectiveness

From FY 2004 through FY 2008, the Sumter NF has sold 12,651 acres of commercial thinning. Approximately 2,127 acres of thinning harvest were sold in FY 2008, which is up slightly from 1,891 acres of commercial thinning sold in FY 2007.

In FY08, 7.1 million cubic feet (MMCF) were offered for sale, the same as the 7.1 MMCF offered for sale in FY07. In FY08, the Sumter NF offered 3.0 MMCF of forest products for sale in management prescription 10B. The main silvicultural practices employed in FY08 were first thinning, intermediate thinning and seed-tree regeneration.

The road program continues to emphasize the reconstruction of roads to meet the intended traffic volumes safely and lessen the impacts to forest resources. Road designs emphasized mitigating negative impacts to resources with the focus on watershed health and aquatic passage. Significant road reconstruction was completed on FSR # 757 and a design completed for aquatic passage on FSR # 733. System road projects associated with timber sales were mainly for resurfacing roads, replacing culverts and removing vegetation encroaching on the roadway. Timber road mileage saw a slight decrease while program road reconstruction increased.

The Forest continued to assess the backlog of deferred maintenance needs with the focus on open roads classified as maintenance level 3, 4, and 5. The forest completed shift of approximately 57.0 miles from maintenance level 3 to maintenance level 2. This will help reduce the road maintenance cost in future years but only slightly as most of these roads receive very little maintenance dollars now.

Forest road mileage remained steady in FY 08 but the forest anticipates some increases in future years with the addition of roads in newly acquired lands on the Enoree and Long Cane districts. No roads were decommissioned for the third year in a row due to other funding requirements.

Most stands are now regenerated by natural regeneration (seed trees vs. planted seedlings). These stands typically have regeneration far in excess of minimum numbers.

In FY2008, 85 acres were purchased on the Long Cane. (Abbeville County provided connectivity to the Long Cane Horse Trail along Cedar Springs Road.). The Sumter landownership adjustment strategy is being implemented and priority areas for acquisition are slowly being acquired.

An integrated resource review was scheduled for the two piedmont districts, Enoree and Long Cane Ranger Districts to review specific projects relative to desired conditions, Forest Plan standards and resource effects. Findings will be included in the FY09 Sumter Monitoring Report

Chapter 1. Introduction

The Sumter National Forest is 365,134 acres in size and is located in the central piedmont and western mountains of South Carolina. It is composed of three districts: Andrew Pickens (AP), Enoree (EN), and Long Cane (LC). The *Revised Land and Resource Management Plan, Sumter National Forest* (Forest Plan), approved on January 15, 2004, guides management activities on the forest. These lands are managed to provide goods and services for timber, outdoor recreation, water, wildlife, fish, and wilderness following multiple-use goals and objectives.

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

Issue 1. Ecosystem Condition, Health and Sustainability

Sub-Issue 1.1 – Biological Diversity

MQ 1: Are rare ecological communities being protected, maintained, and restored?

Information

This monitoring question is responsive to goal 12, objectives 12.01 and 12.02 and standards FW-30, FW-31, and FW-32. Objective 12.01 is to restore 500 to 2,500 acres of table mountain pine forest over the 10-year planning period. Objective 12.02 is to restore one to five percent of the riparian corridor on slopes less than eight percent in the canebrake community over the 10-year planning period in the Piedmont. The monitoring elements are defined as follows:

1. Baseline acreage, condition, and distribution of rare communities on the Forest.

Enoree - Inventories for rare communities were conducted as part of a botanical survey in the Pittman project area. Although no rare communities were found within stands slated for harvest, eight adjacent stands were recognized as basic mesic forest communities of ecological significance by the contractor Dr. Charles Horn of Newberry College.

Andrew Pickens - A 22-acre table mountain pine community was identified within Compartment 61.

2. Rare communities restored. Specifically, table mountain pine dominated communities and canebrakes.

Long Cane - The post oak savanna on the Long Cane was prescribed burned (300 acres).

Andrew Pickens - Non-native invasive plant control was conducted within riverine communities along the Chattooga River. A native species restoration project was conducted in conjunction with the Chattooga Conservancy at the Hwy.28 boat landing.

Results/Findings

To better evaluate acreage, distribution, and condition, a baseline GIS layer of rare communities needs to be developed and maintained on each district.

Projects which restore and maintain rare communities on the Forest should be identified. Non-native invasive plant control and prescribed fire are both important management tools for restoring rare plant communities on the forest.



Native Plant Project near Chattooga River on the Andrew Pickens

MQ 2: Are landscape-level and stand-level composition and structure of major forest communities within desirable ranges of variability?

This monitoring question is responsive to goal 8, objectives 8.01, 8.02, 8.03, 8.04, 8.05 and 8.06.

Objective 8.01 is to restore 2,000 - 6,000 acres of native communities on sites occupied by loblolly pine on the Andrew Pickens District over the 10-year planning period.

Objective 8.02 is to provide 8,000 - 11,000 acres of woodlands in the piedmont and 4,000 – 5,000 acres of woodlands in the mountains on dry-xeric sites in woodland, savanna, open grassland, or shrubland conditions with fire associated rare communities preferred over the 10-year planning period.

Objective 8.03 is to create conditions to restore dry-mesic oak, oak-pine, and pine-oak forest communities on 20,000 acres currently in loblolly pine forest in the piedmont over the 10-year planning period.

Objective 8.04 is to increase shortleaf pine and shortleaf pine/oak communities on 2,000 - 10,000 acres in the piedmont. This will be done on sites with low risk of littleleaf disease.

Objective 8.05 is to increase structural diversity by creating canopy gaps in one to five percent of closed canopy mid and late-successional mesic deciduous forest (including mixed mesophytic and mesic oak forests). Gaps are defined as small openings (smaller than 2 acres in size) and are designed to release mast-producing species, particularly hard mast (e.g., oak, hickory, walnut) and soft mast bearing trees (e.g. cherry, black gum, persimmon) over the 10-year planning period.

Objective 8.06 is to restore more diverse native communities on 1,000 - 2,000 acres currently occupied by white pine stands. Prioritize xeric to intermediate sites over the 10-year planning period.

The monitoring elements are defined as follows:

1. Restore native communities on sites occupied by loblolly pine forest on the Andrew Pickens Ranger District.
2. Prefer rare communities on dry-xeric sites in the piedmont and mountains.
3. Create conditions to restore dry-mesic oak, oak-pine, and pine-oak communities on the piedmont.
4. Increase shortleaf pine and shortleaf pine/oak communities on the piedmont.
5. Restore sites currently occupied by white pine stands to diverse native communities.
6. Increase structural diversity by creating gaps in one to five percent of closed canopy mid- and late-successional mesic deciduous forests.
7. What are the trends in MIS population indices in relationship to major forest community/conditions? Frequency of occurrence trends for hooded warbler, scarlet tanager, pine warbler, Acadian flycatcher, and brown-headed nuthatch.

Results

1. **Objective 8.01.** Loblolly pine removal harvest has already taken place on or gone through the environmental assessment process for 964 acres on the Andrew Pickens Ranger District. The GIS database now shows 5,659 acres of loblolly pine on the districts. This is 1,173 acres less than the 6,832 acres figure on the report 2 years ago. Table 2.1 shows the acreage of loblolly pine removal harvests accomplished or planned to date.

Table 2.1 Woodland projects on the Sumter National Forest

| <u>Timber Sale</u> | <u>EA/Decision</u> | <u>Acres</u> |
|--------------------|--------------------|--------------|
| Village Creek | Village Creek | 167 |
| Hell Hole | Chauga Loblolly | 90 |
| Chauga 1 | Chauga Loblolly | 134 |
| Mt Grove Church | Chauga Loblolly | 34 |
| Hell Stone Branch | Chauga Loblolly | 126 |
| Cedar Creek | Cedar Creek | 106 |
| Tamassee Knob | Ross Mt/Tamassee | <u>38</u> |
| | | 695 |
| Pending | Ross Mt/Tamassee | <u>175</u> |
| | Total to date | 870 |

Also the Andrew Pickens Ranger District is in the planning stages is a district-wide loblolly pine removal project.

2. **Objective 8.02.** Existing and planned woodland habitat areas:

| <u>Acres</u> | <u>District</u> | <u>Area or project</u> |
|--------------|-----------------|--|
| 360 | Andrew Pickens | Garland tract |
| 207 | Andrew Pickens | Cedar Creek project |
| 144 | Andrew Pickens | Compartment 61 (planning stages) |
| 447 | Enoree | Lower Enoree – Indian Creek project |
| 914 | Enoree | Indian Creek Woodlands (planning stages) |
| 964 | Long Cane | Renew project |
| <u>54</u> | Long Cane | Post Oak Savannah |
| 3,090 | | |

Though this acreage is significant, it is much less than the plan objective.

3. **Objective 8.03.** Some data in the GIS database has been lost since the FY 2006 report. This prevented accurate queries on the status of dry-mesic oak, oak-pine and pine-oak forest communities on the Forest (Objective 8.03.)

Activities to increase oak types on the piedmont include 2,571 acres of commercial thinning in the piedmont. 124 acres were precommercially thinned in FY 08. Silvicultural prescriptions generally emphasize release of desirable oaks and hickories where possible.

Queries on the GIS database gave the following results:

| | ACRES | |
|--------------|----------------------------|-----------|
| | Loblolly and Virginia Pine | Oak Types |
| All piedmont | 203,168 | 51,555 |
| Mgt Rx 9G2 | 32,100 | 9,518 |

Activities in FY 2004 to increase oak types on the piedmont:

25 acres Commercial thinning, mgt rx 9G2
64 acres Total

In future years, large acreages of release activities to favor oak and hickory are expected. Significant acreages of thinning in management prescription 9G2 are also expected.

4. **Objective 8.04.** The GIS database currently shows 3,034 acres of shortleaf pine on the piedmont.
5. **Objective 8.06.** The GIS database currently shows 7,115 acres of white pine type on the Andrew Pickens Ranger District. This is a change from the 7,415 acres last year. However, no management activities have taken place to change this figure.
6. No projects were implemented in 2008 to create gaps or alter major forest communities or conditions (See Objective 8.05).
7. Technical report *Population Trends and Habitat Occurrence of Forest Birds on Southern National Forests, 1992-2004* (General Technical Report NRS-9) indicates the mean observations per count for the following MIS in Table 2-2.

Table 2-2. Trends in Mean Observations per Count by Physiographic Region

| Species | Physiographic Area* | |
|-----------------------|-----------------------------|-------------------|
| | Southern Blue Ridge | Southern Piedmont |
| Acadian Flycatcher | declining | increasing |
| Brown-headed Nuthatch | level to slightly declining | increasing |
| Pine Warbler | declining | declining |
| Hooded Warbler | declining | declining |
| Scarlet Tanager | slightly increasing | increasing |

*Andrew Pickens Ranger District is in the Southern Blue Ridge physiographic area and the Enoree and Long Cane Ranger Districts are in the Southern Piedmont physiographic area.

Findings

1. Steady progress is being made toward Objective 8.01. This objective should be met within the planning period.
2. Objective 8.02 is unlikely to be fully achieved during the planning period at current funding and staffing levels given the number of woodland, grassland, savanna, and shrubland projects being planned.
3. Thinning loblolly pine stands will allow sunlight to reach the forest floor and should help stimulate advanced regeneration of oaks and hickories (Objective 8.03).
4. The objective of restoring shortleaf pine communities is unlikely to be fully achieved during the planning period because few areas with adequate soil conditions are being found. Shortleaf pine needs good soil depth (approx 8"+ topsoil) with well-drained to moderately well-drained soils. Past erosion has generally left such soils in very few places. The areas found thus far tend to be very small, isolated parts of certain ridges or flats (Objective 8.04).
5. No projects were implemented in white pine stands in FY 08 (Objective 8.06).

6. The Andrew Pickens Ranger District is proposing a project to meet Objective 8.05. The project is to create canopy gap, and to release soft and hard mast tree species to benefit wildlife.
7. Declines in MIS populations in the Southern Blue Ridge physiographic area reflect lack of open pine stands and dense midstory and understory canopies. Canopy gaps and understory treatments that include use of prescribed fire are needed to maintain and develop desired conditions. Increases in some bird counts are likely due to large forested blocks where oaks are common.

Declines in MIS populations in the Southern Piedmont physiographic area reflect the overstocked conditions in pine forests. Even though prescribed burning is fairly widespread across the piedmont, high stand densities and lack of canopy gaps are preventing desirable understory shrubby layers from developing.

MQ 3: Are key successional stage habitats being provided?

Information

This monitoring question is responsive to goals 8 and 13; desired conditions for management prescriptions 7.E.2, 8.A.1, 8.B.2, 9.A.3, 9.G.2, and 10.B, and standard FW-33. The monitoring elements are defined as follows:

1. Trends in early, mid and late successional habitat by management prescription group.
2. The number of acres, conditions and distribution of existing old growth.
3. Trends in MIS population indices in relationship to major forest community/conditions to help indicate the effects of management on successional habitats. Frequency of occurrence trends in prairie warbler, Swainson's warbler, field sparrow, and American woodcock.

Results

1. Trends in early, mid and late successional habitat by Management Prescription have changed little since the FY 2006 report. (See Table 2.3)
2. There is no new information on existing old growth in 2007-2008.
3. Technical Report *Population Trends and Habitat Occurrence of Forest Birds on Southern National Forests, 1992-2004* (General Technical Report NRS-9) indicates the mean observations per count for the following MIS: prairie warbler, Swainson's warbler, and field sparrow. Information for American woodcock comes from the Southern Forest Resource Assessment.

Prairie warblers are declining across both the Southern Blue Ridge and Southern Piedmont physiographic areas. This species is an indicator of early successional habitat and in particular, open woodlands. Similarly, field sparrows are indicators of grassy woodlands and are frequently associated with early successional habitat.

Swainson’s warbler is also declining in the Southern Blue Ridge physiographic area and is closely tied to early successional habitat. Breeding territories for Swainson’s warbler encompasses forested areas with high stem densities with little ground cover (regeneration areas). Generally speaking, habitat on the Andrew Pickens District consists mostly of mature hardwoods, pines and mixed pine/hardwood stands that are in the middle to late age categories (greater than 60 years old). Very little habitat is in an early successional stage across the District, and only minimal activity is planned.

American woodcock have been declining throughout the mid-Atlantic area and are commonly associated with riparian areas. Declines are largely attributed to increased urbanization, fragmentation of habitat and lack of forest disturbance. Beneficial disturbances would be those that create forest clearings and regenerate hardwood stands.

Table 2.3 Successional habitat across the Sumter National Forest

| Mgt Rx | Total Forested Acres | Successional Stage | ACRES | | | Desired Percentage | Actual Percentage |
|--------|----------------------|--------------------|--------|--------|--------|--------------------|-------------------|
| | | | AP | EN | LC | | |
| 7E2 | 60,663 | Early | 285 | 630 | 760 | 4-10 | 3% |
| | | Mid to late | 9,489 | 20,339 | 20,128 | 50+ | 82% |
| | | Late | 6,740 | 9,420 | 11,304 | 10+ | 45% |
| 8A1 | 38,040 | Early | 659 | | | 4-10 | 2% |
| | | Mid to late | 30,807 | | | 50+ | 81% |
| | | Late | 19,013 | | | 10+ | 50% |
| 8B2 | 7,888 | Early | | 79 | 177 | 10-17 | 3% |
| 9A3 | 11,000 | Early | | 73 | | 4-10 | 1% |
| | | Mid to late | | 10,187 | | 50+ | 93% |
| | | Late | | 3,644 | | 10+ | 33% |
| 9G2 | 42,990 | Early | | 1,263 | 446 | 4-10 | 4% |
| | | Mid to late | | 20,741 | 14,059 | 50+ | 81% |
| | | Late | | 8,576 | 8,894 | 10+ | 41% |
| 10B | 136,438 | Early | | 901 | 3,415 | 10-17 | 5% |
| | | Mid to late | | 59,010 | 45,822 | 20+ | 77% |
| | | Late | | 35,579 | 28,422 | 10+ | 47% |

Findings

1. The same pattern holds across all of the above management prescriptions: an abundance of mid-late successional stage acreage and late successional stage acreage in comparison with desired conditions. In contrast, all management prescriptions are far below the desired condition for early successional stage forests. Many projects are in progress to address this need. Limiting factors in achieving the desired conditions include budgets, limited staffing and NEPA compliance.
2. As stated in the FEIS for the Revised Forest Plan, although existing allocations on the Sumter in mixed mesophytic and river floodplain forests appear to be adequate, acreage in dry-xeric forest, woodland, and savanna types is extremely low. Ongoing efforts to actively restore shortleaf pine and oak forest types and herbaceous understory communities will help promote future old growth communities within desired community types and should continue to be pursued on the forest.
3. Early successional habitat, particularly woodland/savanna habitat is in short supply across all districts of the Sumter National Forest. Progress has been made in recent years with increased regeneration harvest in pine stands and with establishment of woodlands and savanna habitat on all districts.

MQ 4: How well are key terrestrial habitat attributes being provided?

Information

This monitoring question is responsive to goals 3, 4, 8 and 9, Objective 9.01 and standard FW-18. Objective 9.01 is to construct or restore wetlands on 600 acres in the riparian corridor on the piedmont over the 10-year planning period.

The monitoring elements are defined as follows:

1. Acres, conditions, and distribution of wetland habitats and ephemeral wetlands.
2. Trends in MIS population indices in relationship to major forest communities/conditions. Frequency of occurrence trends in pileated woodpecker.
3. Trends in hard mast production capability.

Results

1. No projects were implemented in 2008 to create wetland habitats, improve or restore mast producing hardwood stands or alter major forest communities or conditions.

2. Data to estimate trends remain in transition as the new Regional database is still under construction.
3. No data were collected relative to trends in hard mast production capability.

Findings

1. Wetland habitat development and hardwood restoration activities need to be incorporated into vegetative management projects and other activities on the Forest. A project specifically designed to create canopy gaps and enhance hardwood hard mast for wildlife is in the planning stages on the Andrew Pickens Ranger District.
2. Pileated woodpeckers are a primary indicator of large snag habitat. They also are a good indicator of older forests that have mixtures of live hollow trees and dead trees. Technical Report *Population Trends and Habitat Occurrence of Forest Birds on Southern National Forests, 1992-2004* (General Technical Report NRS-9) indicates the mean observations per count for pileated woodpeckers are increasing on the Andrew Pickens Ranger District and declining on the two Piedmont Districts. The increasing trend in the mountains most likely reflects the large number of pine snags that were created during past southern pine beetle out breaks from 2001- 2003. Larger dead trees and older forest habitat on the two Piedmont Districts are in short supply and mainly occurs in riparian areas.
3. No assessment of hard mast has been done across the Forest. Extensive hardwood habitat is found along riparian areas.

MQ 5: What is the status and trend in aquatic habitat conditions in relationship to aquatic communities?

Information

This monitoring question is responsive to goals 3 and 4 and Objectives 4.01 and 11-OBJ-2. Objective 4.01 is to create and maintain dense understories of native vegetation on one to five percent of the total riparian corridor acreage during the 10-year planning period. Objective 11-OBJ-2 is to restore and enhance stream habitat and aquatic communities on 50 miles of streams. This includes woody debris, stream bank stabilization, brook trout restoration, and in-stream habitat improvement.

The monitoring elements are defined as follows:

1. Trends in the composition and abundance of macroinvertebrate communities.
2. Trends in the composition and abundance of stream fish communities.
3. Trends in aquatic habitat conditions. Perennial and intermittent streams are managed in a manner that provides a source for large woody debris input to channels.

4. Improve, rehabilitate, or restore aquatic habitat.

Results

1. Existing population conditions for macroinvertebrate communities are unknown. Refer to the Sumter National Forest 2005 Monitoring and Evaluation Annual Report (2005 Monitoring Report) for more detailed inventory information on crayfish and mussels. Aquatic insect surveys were conducted in the Chattooga River watershed in October 2007 and September 2008. Results will be available in 2009.

Mussel surveys were conducted on the Andrew Pickens Ranger District in the Chattooga and Chauga River watersheds in 2008. Surveys were also conducted on the Enoree Ranger District in the Broad River watershed. Mussel species collected are listed in Table 2.4.

Table 2.4. Mussel species collected in 2008.

| Scientific Name | Common Name |
|---------------------------------------|--------------------|
| Enoree Ranger District | |
| <i>Elliptio angustata</i> | Carolina lance |
| <i>Elliptio complanata</i> | Eastern elliptio |
| <i>Villosa delumbis</i> | Eastern creekshell |
| Andrew Pickens Ranger District | |
| <i>Alasmidonta varicosa</i> | Brook floater |
| <i>Elliptio angustata</i> | Carolina lance |
| <i>Elliptio producta</i> | Atlantic spike |

The Carolina lance and brook floater are rated as G3 by NatureServe (2009). The rating denotes that a species is at moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors. The brook floater is listed as Threatened by the American Fisheries Society (Williams, et. al. 1992). This listing refers to a species that is likely to become endangered throughout all or a significant portion of its range.

The SC Comprehensive Wildlife Conservation Strategy (Kohlsaet et. al., 2005) includes the South Carolina's 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. All of the mussel species listed in the table are ranked in the SC Comprehensive Wildlife Conservation Strategy. The brook floater is ranked with a highest priority. The Atlantic spike, Carolina lance, Eastern creekshell and Eastern elliptio are ranked with a moderate priority.

Freshwater snails, *Elimia catenaria*, *Helisoma anceps*, *Physa* sp. and *Campeloma decisum*, were also sampled in the Broad River.

Of the 3 mussel species found on the Andrew Pickens Ranger District, the brook floater population within the Chattooga River is of global significance. From Georgia through at least Maryland, this is the best extant population within this range (Alderman, 2008). No mussels were present at the most upstream survey site in the vicinity of Burrell's Ford Road. No mussels were present at survey sites in the Chauga River. However, *Elimia proxima*, a freshwater snail was sampled in the Chauga River.

In addition, *Corbicula fluminea*, the introduced Asian clam was present in the Broad River watershed and the Chauga River watershed.

- Stream fish inventory and monitoring surveys in Sumter National Forest streams were conducted in 2002-2005 for all the Districts (refer to the 2005 Monitoring Report). In addition, fish monitoring was conducted on Hunting Creek in 2008 on the Enoree Ranger District and the results are reported in Table 2.5.

Table 2.5. Fish species surveyed in Hunting Creek, 2001 and 2008

| Scientific Name | Common Name | 2001 | 2008 |
|-----------------------------------|---------------------------|------|------|
| Catostomidae | Suckers | | |
| <i>Erimyzon oblongus oblongus</i> | Creek chubsucker | x | x |
| <i>Moxostoma rupiscartes</i> | Striped jumprock | x | x |
| Centrarchidae | Sunfishes | | |
| <i>Centrarchus macropterus</i> | Flier | | x |
| <i>Enneacanthus gloriosus</i> | Bluespotted sunfish | | x |
| <i>Lepomis auritus</i> | Redbreast sunfish | x | x |
| <i>Lepomis cyanellus</i> | Green sunfish | x | x |
| Cyprinidae | Carps and Minnows | | |
| <i>Cyprinella chloristia</i> | Greenfin shiner | x | |
| <i>Cyprinella zanema</i> | Santee chub | x | |
| <i>Nocomis leptcephalus</i> | Bluehead chub | x | x |
| <i>Notemigonus crysoleucas</i> | Golden shiner | | x |
| <i>Notropis chlorocephalus</i> | Greenhead shiner | x | x |
| <i>Notropis procne</i> | Swallowtail shiner | x | x |
| <i>Notropis scepticus</i> | Sandbar shiner | x | x |
| <i>Semotilus atromaculatus</i> | Creek chub | x | x |
| Esocidae | Pikes | | |
| <i>Esox americanus.</i> | Redfin pickerel | x | x |
| Ictaluridae | Bullhead Catfishes | | |
| <i>Ameiurus natalis</i> | Yellow bullhead | x | x |
| <i>Ameiurus platycephalus</i> | Flat bullhead | x | |
| Percidae | Perches | | |
| <i>Etheostoma olmstedi</i> | Tessellated darter | x | x |
| Poeciliidae | Livebearers | | |
| <i>Gambusia holbrooki.</i> | Eastern mosquitofish | x | x |

All fish species present in Hunting Creek were ranked secure (G5) or apparently secure (G4) by NatureServe (2009). The flat bullhead is listed as Vulnerable by the American Fisheries Society (Jelks et. al. 2008). This indicates that the species is in imminent danger of becoming threatened throughout all or a significant portion of its range due to present

or threatened destruction, modification, or reduction of its habitat or range. Of the 19 species captured in Hunting Creek, the green sunfish is considered non-indigenous or an introduced species to the watershed (Warren, et al. 2000). The remaining species captured are native to the watershed.

The SC Comprehensive Wildlife Conservation Strategy (Kohlsaas, et. al., 2005) includes the South Carolina's 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. Of the species that occur in Hunting Creek, the Santee chub and greenhead shiner are ranked with a high priority. The flat bullhead is ranked with a moderate priority.

Stream fish inventory and monitoring surveys were conducted on the Andrew Pickens District in 2008. A total of 10 sites were sampled in seven streams (Table 2.6).

Eighteen different streams were sampled in 2002-2008. A total of 17 species were captured in both cool and cold water habitats in 2008 (Table 2.7).

Table 2.6. List of Fish Surveys Sites on the Andrew Pickens Ranger District

| Stream | Site # | Watershed | # Species Captured | | | | | | |
|---------------------------|--------|--------------------|--------------------|------|------|------|------|------|------|
| | | | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
| Chauga River | 2 | Chauga River | 10 | | 10 | | | | |
| Chattooga River | | | | | | | | | |
| Big Bend Site | | Chattooga River | | | | | 11 | | 14 |
| Ellicott Rock Site | | Chattooga River | | | | | 12 | | 14 |
| Spoonauger Site | | | | | 14 | | | 16 | |
| East Fork Site | | | | | 9 | | | | |
| Highway 28 Site | | | | | | | | 17 | |
| Pigpen Branch | 1 | Chattooga River | 3 | 3 | | | | 4 | 3 |
| | 2 | | 2 | 3 | | | | 3 | |
| Tamassee Creek | 1 | Chattooga River | 9 | 9 | | | | | |
| | 2 | | | 5 | | | | | |
| | 3 | | | | | | | 1 | 1 |
| Crane Creek | 1 | Cheohee Creek | 1 | | 1 | | 1 | | 1 |
| | 2 | | | | 1 | 1 | 1 | 1 | |
| Left Trib Site | | | | | | | | 1 | |
| Jacks Creek | 1 | Chattooga River | | 1 | | | | 1 | |
| Townes Creek | 1 | Cheohee Creek | | 7 | | | | | |
| Yellow Branch | | Coneross Creek | | 4 | | | | | |
| Bee Cove Creek | | Whitewater River | | 1 | | | | | 1 |
| Howard Creek | | Whitewater River | | 1 | | | | | |
| Limber Pole Creek | | Whitewater River | | 1 | | | | | |
| Moody Creek | | Cheohee Creek | | 1 | | | | | |
| Wilson Creek | | Cheohee Creek | | 0 | | | | | |
| East Fork Chattooga River | 1 | Chattooga River | | 12 | | | | | |
| | 2 | | | 4 | | | 3 | 2 | |
| | 3 | | | 3 | | | | | |
| King Creek | 1 | Chattooga River | | | 5 | 5 | | 1 | |
| | 2 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| US Burrells Ford Rd | 3 | | | | | | | | 1 |
| Indian Camp Branch | 1 | EF Chattooga River | | | | | | | 1 |

| | | | | | | | | |
|------------|---|-----------------|--|--|---|--|---|---|
| Ira Branch | 2 | Chattooga River | | | | | 1 | 1 |
| Fall Creek | | Chattooga River | | | 4 | | | |

Table 2.7 Species Captured in Andrew Pickens Ranger District Streams

| Species | | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|--------------------------------|---------------------|------|------|------|------|------|------|------|
| Catostomidae | | | | | | | | |
| <i>Catostomus commersoni</i> | White sucker | | x | | | x | x | x |
| <i>Hypentelium nigricans</i> | Northern hogsucker | x | x | x | | | x | |
| <i>Moxostoma rupiscartes</i> | Striped jumprock | x | x | x | x | x | x | x |
| Centrarchidae | | | | | | | | |
| <i>Lepomis auritus</i> | Redbreast sunfish | x | x | | | x | x | x |
| <i>Lepomis cyanellus</i> | Green sunfish | | | x | | | | |
| <i>Lepomis gulosus</i> | Warmouth | | | x | | | | |
| <i>Lepomis macrochirus</i> | Bluegill | x | x | | | x | x | |
| <i>Micropterus coosae</i> | Redeye bass | | | | | | x | |
| Cottidae | | | | | | | | |
| <i>Cottus bairdi</i> | Mottled sculpin | | x | x | x | x | x | x |
| Cyprinidae | | | | | | | | |
| <i>Campostoma anomalum</i> | Central stoneroller | | x | x | | x | x | x |
| <i>Clinostomus funduloides</i> | Rosyside dace | | x | | | x | x | x |
| <i>Cyprinella nivea</i> | Whitefin shiner | | | | | | x | |
| <i>Hybopsis rubrifrons</i> | Rosyface chub | x | x | | | | x | |
| <i>Luxilus coccogenis</i> | Warpaint shiner | | x | x | | x | x | x |
| <i>Nocomis leptocephalus</i> | Bluehead chub | x | x | x | | x | x | x |
| <i>Notropis leuciodus</i> | Tennessee shiner | | | | | | x | |
| <i>Notropis lutipinnis</i> | Yellowfin shiner | x | x | x | | x | x | x |
| <i>Notropis spectrunculus</i> | Mirror shiner | | | x | | | x | x |
| <i>Rhinichthys cataractae</i> | Longnose dace | | x | x | x | x | x | x |
| <i>Rhinichthys atratulus</i> | Blacknose Dace | | x | x | | | x | x |
| <i>Semotilus atromaculatus</i> | Creek chub | x | x | x | | | x | x |
| Ictaluridae | | | | | | | | |
| <i>Ameiurus brunneus</i> | Snail bullhead | | | x | | | x | |
| <i>Ameiurus platycephalus</i> | Flat bullhead | x | | | | | | |
| Percidae | | | | | | | | |
| <i>Etheostoma inscriptum</i> | Turquoise darter | x | x | x | | x | x | x |
| <i>Perca flavescens</i> | Yellow perch | x | | | | | | |
| <i>Percina nigrofasciata</i> | Blackbanded darter | x | | x | | | | |
| Salmonidae | | | | | | | | |
| <i>Oncorhynchus mykiss</i> | Rainbow trout | x | x | x | x | x | x | x |
| <i>Salmo trutta</i> | Brown trout | x | x | x | x | x | x | x |
| <i>Salvelinus fontinalis</i> | Brook trout | x | x | x | x | x | x | x |

All fish species surveyed were ranked secure (G5) or apparently secure (G4) by NatureServe (2009). The flat bullhead is listed as Vulnerable by the American Fisheries Society (Jelks et. al. 2008). This indicates that the species is in imminent danger of becoming threatened throughout all or a significant portion of its range due to present or threatened destruction, modification, or reduction of its habitat or range. Of the 29 species (2002-2008) captured in Andrew Pickens Ranger District streams, five are considered non-indigenous or introduced species to the watershed (Warren, et al. 2000).

These include the green sunfish, yellowfin shiner, yellow perch, rainbow trout and brown trout. The remaining species captured are native to the watershed.

The brook trout is designated as a S2 species by the SC Heritage Program. It has also been identified as a species of conservation concern in South Carolina by the South Carolina Department of Natural Resources (Kohlsaet et. al., 2005). Also included as species of conservation concern in South Carolina are the redeye bass, turquoise darter, blacknose dace, central stoneroller, flat bullhead, longnose dace, mirror shiner, rosyface chub, snail bullhead, Tennessee shiner and warpaint shiner. The population status of these species is considered to be currently stable throughout all or a significant portion of their range. The fish species diversity of the Management Indicator Community in the Chattooga River watershed has not changed in more than 20 years of sampling the main stem of the river. Brook trout populations are considered stable in two recently restored streams. In one of those streams where brown trout were removed, the brook trout population is higher in density and biomass than other SC brook trout streams.

3. There were no aquatic habitat surveys conducted in 2008.
4. There were no habitat improvement projects implemented in 2008.

Findings

1. Three mussel species were surveyed in the Chattooga River watershed on the Andrew Pickens Ranger district. No mussel species were found in the Chauga River watershed. Three mussel species were surveyed in the Broad River watershed on the Enoree Ranger District. Aquatic insect surveys were conducted in the Chattooga River watershed in October 2007 and September 2008. Results will be available in 2009.
2. Eighteen streams have been inventoried across the mountains, and repeated samples have been conducted in nine of those streams. Twenty nine species have been captured across the Andrew Pickens Ranger District. The fish species diversity of the Management Indicator Community in the Chattooga River watershed has not changed in more than 20 years of sampling the main stem of the river. Brook trout populations are considered stable in two recently restored streams.

MQ 7: What are the status and trends of federally listed species and populations or habitats for species with viability concerns on the Sumter National Forest?

Information

This monitoring question is responsive to goals 4, 10 and 12, Objectives 10.01 and 10.02, and standards 9F-1 through 9F-8 and FW-25 through FW-28. Objective 10.01 is to maintain or restore at least eight self-sustaining populations for smooth coneflower, and if possible, four populations for small whorled pogonia on the Andrew Pickens, including the habitat to support them. Objective 10.02 is to maintain or restore at least eight self-sustaining populations for

Georgia aster and one population for Florida gooseberry on the piedmont districts and the habitat to support them.

The monitoring element is defined as follows:

1. Trends in recovery of threatened and endangered species (TES), and status and distribution of some viability concern species that are not specifically identified under other elements. Species targeted under this element will be determined through periodic review of each species' status and conservation priority. Priorities will likely vary through the life of the Forest Plan as new information is available.

Results

Long Cane/Enoree - Monitoring of the federal candidate for listing Georgia aster in 2008 took place, and a management plan was developed which involved both the Enoree and Long Cane Ranger Districts. A new population of Georgia aster, comprised of over 1500 plants, was discovered on the Enoree RD by FS personnel. Information from both monitoring and management plans were shared with the U.S. Fish and Wildlife Service in response to the 5-year status review. The management plan identified larger scale woodland restoration areas (>10 acres) in proximity to known locations, prescribed burning throughout the Sumter National Forest, and outlined population objectives, desired conditions for these areas, and management activities and timeframes needed to achieve desired conditions. Thirty acres of prescribed burning was conducted on the Enoree RD for Georgia Aster.

The Forest Service monitored the federally threatened Florida Gooseberry on the Long Cane RD and worked with the U.S. Fish and Wildlife Service in completing the 5-year status review for the federally endangered Florida gooseberry (available at <http://www.fws.gov/southeast/5yearReviews/5yearreviews/index.html> Miccosukee gooseberry.pdf).

A survey for freshwater mussels, including the federally endangered Carolina heelsplitter and sensitive brook floater, was conducted within the Broad River Basin on the Enoree RD by John Alderman, Alderman Environmental Services. Three freshwater mussel species were documented as extant within the areas surveyed for this project: common elliptio (*Elliptio complanata*), Carolina lance (*Elliptio angustata*), and eastern creekshell (*Villosa delumbis*).

Andrew Pickens – A survey of freshwater mussels was conducted within the upper Chattooga River basin on the Andrew Pickens RD by John Alderman, Alderman Environmental Services. Three freshwater mussel species were documented as extant within the Chattooga River: brook floater, Atlantic spike (*Elliptio producta*), and Carolina lance (*Elliptio angustata*). No mussel taxa were observed within the Chauga River, its tributaries, or Chattooga River tributaries.

A project to improve habitat for the sensitive sun-facing coneflower was implemented on the Andrew Pickens RD as was a project to improve habitat for the federally endangered smooth

coneflower. Ten acres of prescribed burning was conducted on the district for smooth coneflower.

Monitoring of the federally endangered smooth coneflower and federally threatened small-whorled pogonia was conducted by FS and SCDNR personnel, and of the federally threatened species small whorled pogonia. A new population of smooth coneflower of approximately 100 rosettes was located on Joel's Ridge by SCDNR personnel.

The following is a summary of the status of known information of status and distribution of TES on the Sumter National Forest.

| Species | Ranking | Status |
|--|----------------------|--|
| Bald Eagle | Federally Threatened | Three nests; including two active nests within the Broad River on the Enoree, and one nest on the Long Cane abandoned since 1999 |
| Wood Stork | Federally Endangered | No known roost sites on the Forest; wetlands used for late summer foraging |
| Carolina Heelsplitter | Federally Endangered | Critical habitat on the Forest includes stream reaches within two watersheds on the Long Cane |
| Smooth Coneflower | Federally Endangered | Known from ten populations and 2,227 rosettes in 2007, an increase from 1,388 rosettes in 2004 and 1,153 in 1993. Of the ten populations, 1 has excellent viability, 1 good, 6 fair, and 2 poor. |
| Small Whorled Pogonia | Federally Threatened | On the Andrew Pickens RD, species has gone from a high of 53 known plants from 3 sites in 1995, to eight plants from 2 sites in 2004, but then increased in 2008 to 36 plants from 3 sites. |
| Florida Gooseberry | Federally Threatened | Seven colonies occur within one site spread through an approximately 150 acre hardwood stand on the Long Cane; colony area has expanded from 33.85 m² in 1994 to 178.65m² in 2007 |
| Persistent Trillium | Federally Endangered | Not known from the Forest; known from the Tugaloo watershed adjacent to the Andrew Pickens RD |
| Relict Trillium | Federally Endangered | Not known from the Forest; known from land adjacent to the Long Cane RD |
| Southern Appalachian Salamander | Sensitive | Hybridizes with <i>Plethodon jordanii</i> and <i>Plethodon glutinosus</i> . Common on the Andrew Pickens. |
| Webster's Salamander | Sensitive | Census in 2002-2003 documented 252 individuals on the Long Cane, with a capture rate of 8.5 salamanders/hour |
| Bachman's Sparrow | Sensitive | Few species records; species is rare on the piedmont due to lack of habitat |
| Migrant Loggerhead Shrike | Sensitive | No species records; agricultural habitat preferred by the species is lacking on National Forest system lands |
| Chauga Crayfish | Sensitive | Located by Eversole, in 23 % of streams sampled for crayfish within Chattooga and Chauga River basins |
| Carolina Darter | Sensitive | Not known from the Forest but range includes the Broad River on the Enoree |
| Robust Redhorse | Sensitive | Stocked in the Broad River in 2004; Known historically from the Savannah River below Augusta, GA |
| Diana Fritillary | Sensitive | Two locations documented on the Andrew Pickens within open, fire-maintained woodlands; thought to be common |
| Rafinesque's Big-Eared Bat | Sensitive | Five roost sites documented from the Andrew Pickens RD. |
| Eastern Small-Footed Myotis | Sensitive | Two records from the Andrew Pickens |
| Brook Floater | Sensitive | Large population in the Chattooga River; |
| Rayed Pink Fatmucket | Sensitive | Not currently known from the Forest but ranges within the Saluda River watershed on the Long Cane |
| Indigo Bush | Sensitive | Two populations known from the Forest, one on the Enoree and one on the Long |

| | | |
|------------------------------|------------------------------|---|
| | | Cane |
| Fort Mountain Sedge | Sensitive | Four sites known on the Andrew Pickens |
| Radford's Sedge | Sensitive | Common on the Andrew Pickens |
| A Liverwort) | Sensitive | Conserved in waterfall spray communities on the Forest |
| Spreading Pogonia | Sensitive | Common on the Andrew Pickens but not well documented |
| Whorled Horsebalm | Sensitive | Common on the Andrew Pickens |
| Mountain Witch Alder | Sensitive | Three sites known from the Forest |
| Shoal's Spider Lily | Sensitive | Three sites known historically from the piedmont districts on the Forest; none relocated in 2004 |
| Butternut | Sensitive | Nine sites known from the Forest |
| Fraser's Loosestrife | Sensitive | Several locations (35 based on 1995 monitoring) known from roadsides and powerline rights-of-ways within the administrative boundary of the Andrew Pickens; 1,724 plants identified at that time; threatened by roadside maintenance activities |
| Sweet Pinesap | Sensitive | Known from eight sites on the Forest, common on the Andrew Pickens |
| A Liverwort | Sensitive | Conserved in waterfall spray communities on the Andrew Pickens |
| A Liverwort | Sensitive | Conserved in waterfall spray communities on the Andrew Pickens |
| Carolina Plagiomnium | Sensitive | Conserved in waterfall spray communities on the Andrew Pickens |
| Oglethorpe Oak | Sensitive | 35 sites on the Long Cane confirmed; the majority comprised of only sprouts and small trees; species appears to be infected with fungus similar to chestnut blight |
| A Liverwort | Sensitive | Conserved in waterfall spray communities on the Andrew Pickens |
| Hartwig's Locust | Sensitive | Known from one site on the Andrew Pickens |
| Sun-Facing Coneflower | Sensitive | Locally common along roadsides near Lake Cherokee |
| Southern Oconee Bells | Sensitive | Common near Lake Jocassee where it is known from three sites on the Forest |
| Georgia Aster | Federal Candidate; Sensitive | 9 populations known from the Enoree and Long Cane Ranger districts, including 2 on the Long Cane RD (1 poor and 1 excellent viability) and 7 on the Enoree RD (3 with poor viability, 4 with fair viability, and 1 with excellent viability) |
| Ashleaf Goldenbanner | Sensitive | No sites documented on the Andrew Pickens Ranger district but species thought to be common |
| Lanceleaf Trillium | Sensitive | Two sites known on the Long Cane Ranger district |
| Nodding Trillium | Sensitive | Four sites documented on the Forest, including two on the Andrew Pickens, one on the Long Cane, and one on the Enoree |
| Jeweled Trillium | Sensitive | Six sites known on the Andrew Pickens including one at Station Cove |
| Piedmont Strawberry | Sensitive | 34 sites documented on the Andrew Pickens where |

Findings

1. **Enoree/Long Cane** - Current conditions are that 2 populations for the candidate for federal listing Georgia aster are excellent, 4 are fair, and 4 are poor based on definitions by Natureserve (2008). Implementation of the management plan is needed to achieve forest plan objective 10.2, to ensure 8 self-sustaining (excellent viability) of Georgia Aster.
2. **Andrew Pickens** - Current conditions are that of ten populations for the endangered smooth coneflower, 1 has excellent viability, 1 good, 6 fair, and 2 poor (based on definitions by Natureserve). In order to achieve the forest plan objective of maintaining 8 self-sustaining populations for smooth coneflower, the district needs to continue to maintain and improve habitat conditions for the species on the forest.

3. *Andrew Pickens* - Continue and expand survey and monitoring efforts for all other TES species.

MQ 8: What are the trends for demand species and their use?

Information

This monitoring question is responsive to goals 8, 22 and 23 and Objective 23.01. Objective 23.01 is to maintain or improve 150 acres of ponds/lake habitat for recreational fisheries.

The monitoring elements are defined as follows:

1. Trends in harvest data for bobwhite quail, white-tailed deer, Eastern wild turkey, and black bear; Wildlife Management Area (WMA) permits sales, turkey tags, and bear permits issued.
2. Trends in MIS population indices in relationship to major forest community/conditions. Frequency of occurrence trends in bobwhite quail, Eastern wild turkey, and black bear.
3. Maintain or improve ponds/lakes for recreational fisheries.

Results

1. Every year since 1988 the South Carolina Department of Natural Resources (SCDNR) has conducted the Bobwhite Quail Hunter Survey. The purpose of the survey is to collect quantitative information on hunter success which aids biologists in tracking quail population trends. The 2007-2008 survey shows that hunters flushed an average of 0.58 coveys per hour. This is not significantly different from the 2006-2007 season. From 1988 to present, there has been a steady decline in coveys found per hour.

White-tailed deer harvest estimates continue to be relatively stable from previous years.

According to the SCDNR's "2008 South Carolina Turkey Harvest Report," 15,118 adult gobblers and 2,186 jakes were harvested statewide during the 2008 Spring season (total harvest of 17,304). This is an 8.9 % decrease from the 2007 season. This decrease in harvest is attributed to poor reproduction. Despite the reduced harvest, the number of turkey hunters in 2008 increased 8 % over 2007.

Black bear occur in the upstate counties of SC. Bear population are increasing and their range is expanding. During the 2008 season, 46 bears were harvested. This number represents the fourth highest harvest since 1970.

2. Bobwhite quail numbers continue to show declines statewide but appear to have stable to upward trends on portions of the piedmont on the Enoree and Long Cane Ranger Districts.

Turkey populations have declined in both the Southern Blue Ridge and Southern Piedmont physiographic regions. Key habitat components for the species are mature hardwood bottoms, scattered openings, and open uplands that are maintained with prescribed fire. Early successional habitat, including woodlands, is very limited across the Districts. Turkey populations are closely associated with brood-rearing habitat.

Black bear habitat has tripled in the mountains and the population is increasing.

3. There are 11 recreational fishing ponds totaling 89 acres on the Sumter National Forest. Largemouth bass and bream are the primary fish in the ponds. A few of the ponds have been stocked with catfish.

Findings

1. Continued effort on the Forest is needed to establish and maintain woodland and savanna habitats. Emphasis should be placed on developing and maintaining escape cover for black bear. Mast-producing hardwood restoration activities need to be incorporated into vegetation management projects on the districts.
2. Stable to upward trends for quail habitat on the piedmont likely reflects fire-maintained forests. Early successional habitat woodland habitat is being developed but is still less than one percent on the districts. Continued emphasis needs to be placed on thinnings, woodland habitat creation, regeneration harvest, and use of prescribed fire.

As with quail, turkeys will benefit from projects that increase early successional woodland habitat, thinnings and prescribed fire that keeps understories open. This should improve and increase brood-rearing habitat as well.

The upward trends on black bear and its habitat reflect the amount of mature habitat on the Andrew Pickens Ranger District.

3. Ponds will be periodically monitored to determine condition.

Sub-Issue 1.2 – Forest Health

MQ 6: What is the status and trends of forest health threats on the Sumter National Forest?

Information

This monitoring question is responsive to goals 7, 15, 16, and 20; Objectives 15.01, 17.01 and 20.01; and standards 9F-8 and FW-27. Objective 15.01 is to control non-native invasive plants on, at a minimum, 1,000 acres by the end of the 10-year planning period, emphasizing management prescriptions where biodiversity or restoration is a primary objective. Objective 17.01 is to improve forest health on 10,000 – 50,000 acres of pine forests by reducing stand density. Objective 20.01 is to maintain fire regime condition class 1 by restoring historic fire return intervals and reducing the risk of losing ecosystem components to wildlife on approximately 250,000 acres over the 10-year planning period.

The criteria for classifying lands in fire regime condition class (FRCC) 1 are:

- Fire regimes are within or near the historical range.
- The risk of losing key ecosystem components is low.
- Fire frequencies have departed from historical frequencies by no more than one return interval.
- Vegetation attributes (species composition and structure) are intact and functioning within an historical range.

Where appropriate, these areas can be maintained within the historical fire regime by treatments such as fire use.

The monitoring elements are defined as follows:

1. Condition and trends of forest fuels and acres of hazardous fuels treated through wildland fire use, prescribed fire and mechanical treatments.
2. Maintain fire regime condition class 1 by restoring historic fire return intervals and reduce the risk of losing ecosystem components to wildfire.
3. Compliance with National Ambient Air Quality Standards (NAAQS) air particulate emissions from National Forest system lands [36 CFR 219.27(a) (12)].
4. Improve forest health in pine stands by reducing stand densities.
1. Treatments to eliminate or control non-native invasive species. Emphasize treatments for PETS or to specific areas. Baseline acres infested with non-native plants by species.

Results

1. In 2008 18,952 acres were treated with prescribed fire on the Sumter. This is a decrease from the 26,276 total of acres in 2007 and reflects a 28 % decrease in total acres burned.
2. Estimates for the amount of condition class 1 lands have been made using existing stand data (CISC) for the Forest. The estimate indicates that approximately 14 % of the Forest is currently in condition class 1. Continuing installation and use of the FSM 5140, SUPP. R8-5100-2005-1 monitoring plots and protocol will provide good information for trends of ecosystem components. To date twenty two monitoring plots have been installed.
3. The two main activities that cause air pollution within the Sumter National Forest are motor vehicle use and prescribed fires. Both of these activities emit pollutants that can increase ozone and fine particulate matter concentrations. During 2009, the Sumter National Forest conducted prescribed fire on 18,905 acres. Estimated fine particulate matter emissions from those fires are 624 tons. The breakdown of prescribed fire within each ranger district is as follows:
 - *Andrew Pickens RD.* 1,963 acres burned, with an estimated 65 tons of particulate matter emissions released.
 - *Enoree RD.* 7,904 acres burned, with an estimated 261 tons of particulate matter emissions released.
 - *Long Cane RD.* 9,038 acres burned, with an estimated 298 tons of particulate matter emissions released.

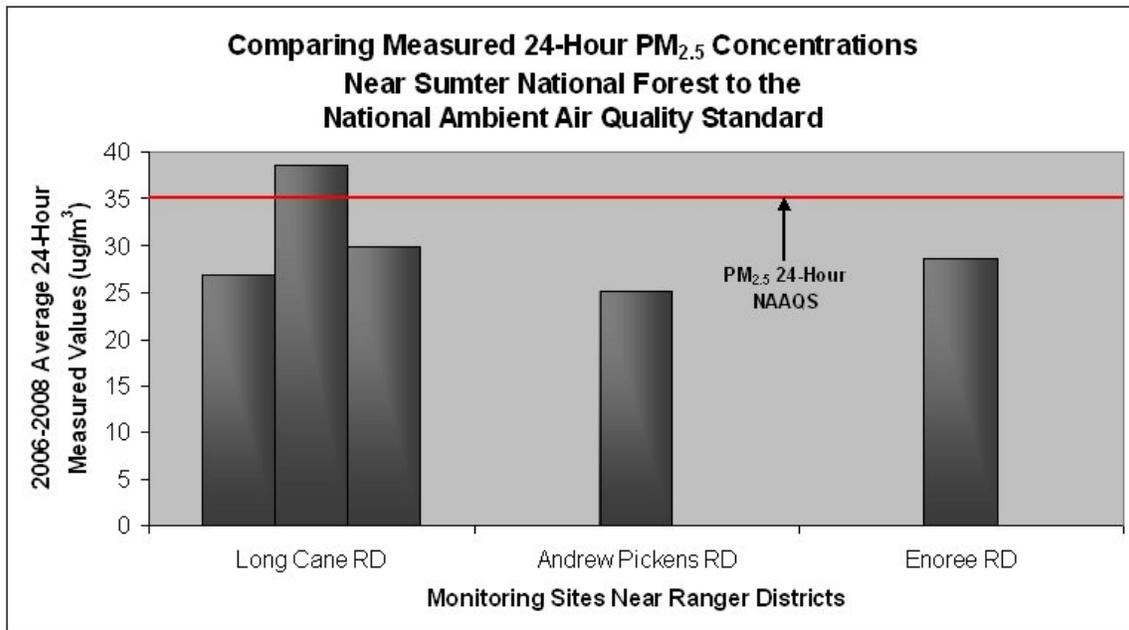
Particulate Matter. Ultra-small particles that can cause beautiful vistas to become murky and cause negative health impacts to visitors are called fine particulate matter, or PM_{2.5}. These tiny particles, less than 2.5 microns in diameter, include sulfates and nitrates from fuel combustion activities, particularly coal-fired power plants and highway vehicles, as well as organic and elemental carbon compounds from wild and prescribed fires, gasoline and diesel engines, and other fossil fuel combustion.

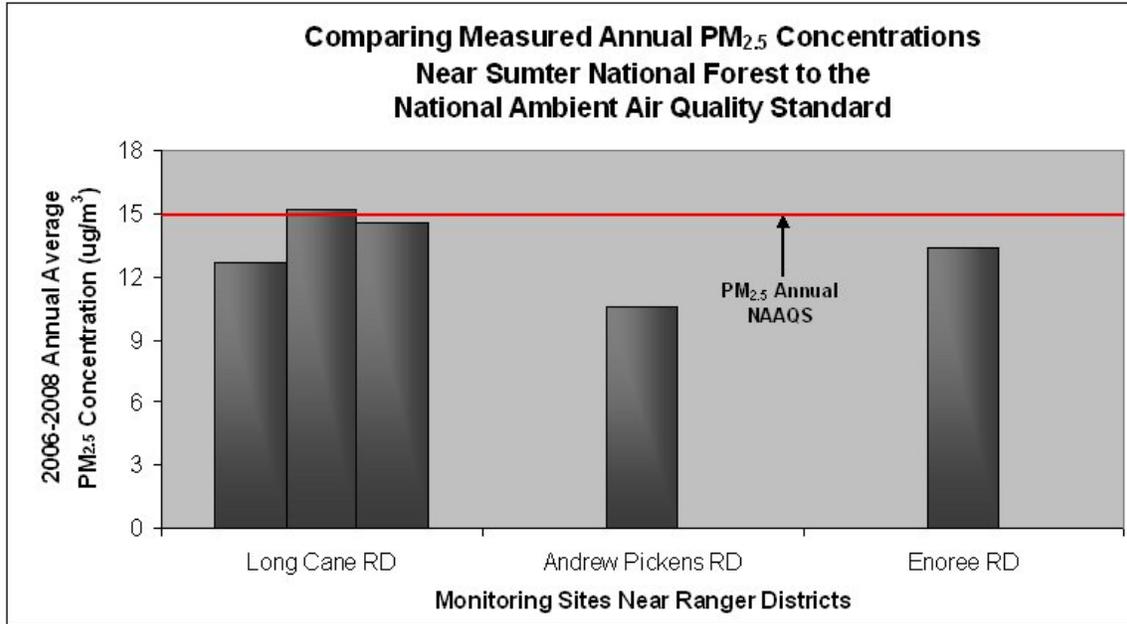
In order to reduce fine particulate matter concentrations, the United States Environmental Protection Agency (EPA) has developed two separate strategies. First, EPA has established a NAAQS for PM_{2.5}; the daily standard is set at 35 µg/m³, while the annual standard is set at 15 µg/m³. In addition to the NAAQS for fine particulate matter, EPA has also implemented the Regional Haze Rule which calls for states and federal agencies to work together to improve visibility at all Class I areas. Although there are no Class I areas near the Sumter National Forest, emission reductions taken as part of the Regional Haze Rule will improve air quality throughout the Forest.

The South Carolina Department of Health and Environmental Control (DHEC) operates fine particulate matter monitoring sites throughout the state, including several near the three noncontiguous ranger districts of the Sumter National Forest.

- Andrew Pickens Ranger District.* This portion of the Sumter National Forest is located in the northwestern corner of South Carolina in Oconee County. The only wilderness area within the Sumter National Forest, Ellicott Rock, is located within this District. PM_{2.5} concentrations are measured at one adjacent monitoring site, also located in Oconee County.
- Enoree Ranger District.* The Enoree Ranger District is located in north-central South Carolina; portions of the District fall within Chester, Fairfield, Laurens, Newberry and Union Counties. A nearby monitoring station in Spartanburg County (21.7 miles northwest of the District) measures PM_{2.5} concentrations in the area.
- Long Cane Ranger District.* This District is located along the border between South Carolina and Georgia, with portions of the Forest falling in Abbeville, Edgefield, Greenwood, McCormick, and Saluda Counties. There are three PM_{2.5} monitoring stations currently situated nearby: one in Edgefield County, 8.1 miles east of the District; and two located south of the District in Richmond County, Georgia. These two monitoring sites are located 6.8 miles and 8.7 miles south of the District, respectively. Until recently, a monitoring site in Greenwood County, only 3.1 miles east of the District, was able to provide PM_{2.5} concentrations; however, in 2008 this monitor did not operate.

The measured values and trends at the above monitoring sites as compared to both the daily and annual PM_{2.5} NAAQS are shown in the graphs below.





As shown, one monitor located near the Long Cane Ranger District is violating both the 24-hour and the annual fine particulate matter air quality standard. This monitor is situated in Richmond County, Georgia, 6.8 miles south of the District. Although this area is not currently designated as nonattainment with the NAAQS, it may be in the future. Future nonattainment designation would require coordination between the Forest and SC DHEC to ensure that any emissions from Forest activities, particularly prescribed fires, are included in the State Implementation Plan (SIP).

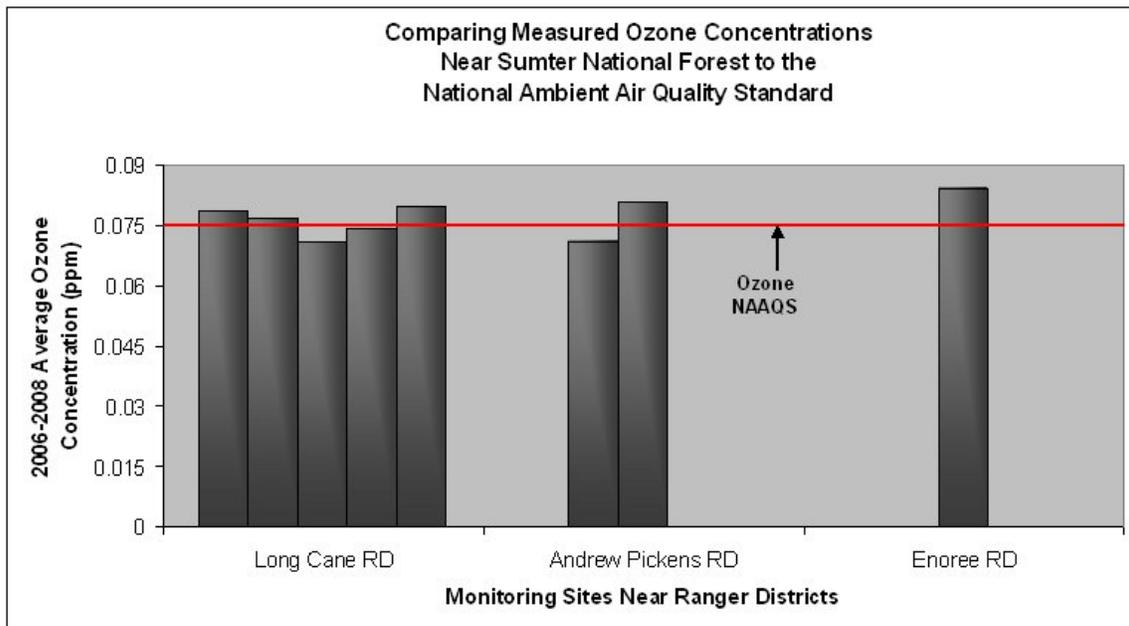
Despite the measured concentrations of fine particulate matter near the Long Cane Ranger District being above the air quality standard, other monitoring sites nearby are not experiencing elevated concentrations. Fine particulate matter concentrations near the Andrew Pickens and Enoree Ranger Districts are also not elevated. Therefore, at this time it is assumed that fine particulate matter concentrations on the Sumter National Forest are not causing negative impacts to visitors, nor causing significant decrease to visibility within the Forest.

Ozone. Exposure to elevated ozone levels can cause human health concerns as well as negative impacts to vegetation. As with fine particulate matter, a national air quality standard for protection of both public health and the environment has been set for ground level ozone. Previously, this standard was set at 0.08 parts per million (ppm). Effective May 27, 2008, however, the US EPA reduced the ozone NAAQS to 0.075 ppm. To attain this standard, the three-year average of the fourth-highest daily maximum eight-hour average ozone concentrations measured at each monitor within an area must not exceed 0.075 ppm.

There are several monitoring sites that measure ozone near the three ranger districts of the Sumter National Forest.

- *Andrew Pickens Ranger District.* Ozone concentrations are currently measured at two monitoring sites near the District. The ozone monitor in Oconee County is adjacent to the District, while an ozone monitor in Pickens County is located 17.4 miles east of the District.
- *Enoree Ranger District.* Only one nearby monitoring station currently measures ozone, although in 2007 there were three sites operating nearby. The currently operating site is located in Spartanburg County, 28 miles west of the District. Previously, there were monitoring sites located in Chester and Union Counties, 10.6 miles and 0.6 miles respectively from the District; however, these sites did not operate in 2008.
- *Long Cane Ranger District.* There are five ozone monitoring stations currently operating near the Long Cane Ranger District. A monitor in Columbia County is less than 0.6 miles west of the District. There are also monitors located in Abbeville County, 6.8 miles north of the District; Edgefield County, 8.1 miles east of the District; Aiken County, 21.1 miles south of the District; and in Richmond County, GA, 8.7 miles south of the District.

The graph below shows the 3-year average ozone concentrations at each of the above monitoring sites in comparison to the newly promulgated ozone NAAQS.



4. In FY 2008, 2,571 acres of commercial thinning were sold.
5. Baseline acres infested with non-native invasive plant species are collected sporadically on the forest and sometimes in conjunction with project plant surveys (Long Cane RD). Infestations of non-invasive plants are very high on the two piedmont districts where the majority of stands are infested with at least one non-native invasive plant species. Dr. Charles Horn documented 89 records for non-native invasive plants within the Pittman project area on the Enoree. USFS personnel documented 17 locations and 56.5 acres of non-native invasive plants within the Duncan Analysis Area (AA) and 156 acres infested with non-native invasive plants in the Lower Tyger AA (Mackie, 2008). On the Andrew Pickens RD, invasive plant populations were documented along roadsides and the fish hatchery adjacent to the Ellicott Wilderness (Gaddy, 2008). Many areas on the Andrew Pickens RD are invasive plant-free. No GIS layer for the Forest of stands infested with non-native invasive plants currently exists for the forest.

The Sumter National Forest treated **872** acres of non-native invasive plants in 2008, including 402 acres on the Enoree, **325** acres on the Long Cane, and 145 acres on the Andrew Pickens. On the Enoree and Long Cane, treatments occurred primarily in uplands. On the Andrew Pickens, 105 acres of treatment occurred within the Chattooga Wild and Scenic River corridor whereas 40 acres occurred along roadsides. The reporting database for treatments is FACTS.

Findings

1. Prescribed burning on the Forest in 2008 was short of the annual objective of 23,600 acres per year set by the Forest Plan. This shortfall was created by continuing drought conditions that pushed weather/fuel parameters outside prescription limits, limiting the number of burn days. All three Districts shared personnel and equipment to help achieve this forest-wide objective. The forest-wide objective is likely achievable in the future even with the additional complexity of burning and smoke management issues. Also, the fire organization for the Sumter has been reorganized in an effort to be more productive and efficient.
2. The number of acres in condition class 1 is increasing because of increased prescribed fire use and non-commercial and commercial mechanical treatments of forest stands. Stewardship contracts and timber sales are providing more opportunities for treating fuels than existed a few years ago.
3. While fine particulate matter concentrations near the Forest generally meet air quality standards, ozone concentrations are elevated and do not meet the newly promulgated National Ambient Air Quality Standard for this pollutant. Negative impacts to vegetation within the Forest may be occurring. Non-attainment designations for ozone will occur in 2010, and it is likely that most, if not all, of the Sumter National Forest will fall into ozone non-attainment. Coordination between the Forest and SC DHEC will be necessary

Each District of the Forest has at least one nearby monitoring site that shows elevated ozone concentrations. Although none of these areas are currently designated nonattainment with the ozone standard, it is very likely that each of these areas will be part of a nonattainment area once the Environmental Protection Agency makes their final designations with the new ozone standard. Designations are expected to take place by March 2010. Because ozone levels are elevated at monitoring sites close to all ranger districts within the Forest, negative impacts to both human health and vegetation may be occurring.

4. From FY 2004 through FY 2008, the Sumter NF has sold 12,651 acres of commercial thinning.
5. **Enoree:** Monitoring of kudzu treatments on the Enoree RD has suggested that more effective herbicides were needed in order to achieve control of kudzu, so a new Forestwide NEPA decision was initiated in 2008 to address use of alternative herbicides for treating kudzu and other invasive plant species, on an additional 5000 acres of land, and to allow for treatments on adjacent private lands with landowner permission under our Wyden Amendment authorities.

Andrew Pickens: Control of Chinese privet has been achieved on the Garland (340 acres) and Back 90 tracts (45 acres) on the Andrew Pickens, though monitoring suggests that autumn olive is beginning to invade one section of the Garland tract. Control of autumn olive, Chinese privet, and other non-native invasive plant species is ongoing within sections of the Chattooga River Corridor and Norton fields which borders the Tamassee Creek Botanical/Zoological Area.

To accurately track control efforts, as well as compliance with existing NEPA decisions, initial treatment and retreatment of non-native invasive plants needs to be linked to the same FACTS ID over time. A forestwide GIS layer of known locations for non-native invasive plants, linked to the treatment database by a FACTS or Infestation ID, should be developed and maintained on each district.

Sub-Issue 1.3 – Watershed Condition and Riparian Areas

MQ 15: Are watersheds maintained (and where necessary restored) to provide resilient and stable conditions to support the quality and quantity of water necessary to protect ecological functions and support intended beneficial uses?

Information

This monitoring question is responsive to goals 1, 2, 3 and 5 and objectives 1.01, 2.01, and 5.01. Objective 1.01 is to improve soil and water conditions on 1,500 acres through stabilization or rehabilitation of actively eroding areas such as gullies, barren areas, abandoned roads or trails, and unstable stream banks over the 10-year planning period. Objective 2.01 is in-stream flows needed to protect stream processes, aquatic and riparian habitats and communities, and recreation and aesthetic values will be determined on 50 streams. Objective 5.01 is to improve soil productivity on 8,000 acres of disturbed, low productivity, eroded soils with loblolly and shortleaf pine in the piedmont during the 10-year planning period.

The monitoring elements are defined as follows:

1. Are State BMPs and forest standards being implemented to protect and maintain soil and water resources?
2. Improve soil and water conditions through stabilization or rehabilitation of actively eroding areas such as gullies, barren areas, abandoned roads or trails, and unstable stream banks.
3. Improve soil productivity on disturbed, low productivity, eroded soils with loblolly and shortleaf pine in the piedmont.
4. The in-stream flows needed to protect stream processes, aquatic and riparian habitats and communities, and recreation and aesthetic values will be determined.

Results

1. Timber harvest activities are monitored by sale administrators and inspectors to ensure the implementation and effectiveness of erosion control and water quality protection measures. Contract language is consistent with the intent of BMPs. Field inspections during activities and a final review are required of all measures upon sale closure. The inspection forms are included with the other sale documentation collected. Harvesting is one of several areas monitored by forest watershed specialists to help spot check quality control. The forest has maintained a strong adherence to and intends to fully implement BMPs to limit water quality and other effects on the land. This intent is also formalized in the Forest Plan revision in forest-wide standards FW-1, FW-2 and others that include specific measures that are intended to protect water quality and address associated soil and water conservation issues. An agreement with the SC Forestry

2. In 2008, a total of 67 acres were treated to improve soil and water conditions. This included 35 acres of gully restoration including site reshaping and erosion control, 25 acres of closing and stabilizing user created trails, 3 acres of streambank stabilization and 4 acres of native grass enhancement for seed production for erosion control and soil recovery needs. Native grasses are used for erosion control on treated gullies, trails and other exposed areas. This level of implementation is somewhat below the plan level indicated in Objective 1.01 of 1,500 acres over a decade. There continues to be areas needing treatment. User created horse and ATV trails are expanding and causing erosion and other impacts that need to be addressed.
3. A total of 791 acres of severely eroded, low site lands in poor watershed condition were fertilized including 45 acres of soil and water improvement (NFVW) funding and 746 acres of sale area improvement (CWKV) funding. All areas were reviewed and/or sampled in the field prior to treatment to be sure that they met the criteria for needing fertilization. The annual treatment amount of soil productivity improvements is on track and close to the planned level of 8,000 acres over a decade.
4. There were no accomplishments in 2008 toward developing a protocol process to work on reaching objective 2.01 relative to determining instream flow needed to protect streams, habitats, recreation and aesthetic values. No funding was allocated to this task or to get started on the protocol for determining in-stream flows. However, substantial effort was made to address sand mining and bank instability issues within the Broad River.

Findings

BMP compliance checks with the SC Forestry Commission on areas with ground disturbance or streamside management with the SC Forestry Commission have been developing into a regular activity. When the checks are made, assistance from the forest soil and water specialists and districts personnel occur when possible to help evaluate the BMPs to ensure their implementation and effectiveness. Special attention should be placed on ground disturbing

practices that occur in sensitive soil areas, wetlands, riparian corridors or when ground disturbing activities concentrate over substantial areas of the landscape or within specific drainages.

The 67 acres of soil and water improvements under Objective 1.01 was only 46% of the 150 acre annual average needed to meet plan direction. Even though this was an increase over 2007, this is again substantially below the plan level needed to meet plan goals and what has historically been accomplished toward the watershed improvement backlog. Since funding and priority shifts seem to be continuing, CWKV or other funding sources may be pursued to help with the plan objectives for addressing poor soil and water conditions due to eroding gullies and barrens (galls), abandoned or unclassified roads, user created trails and unstable streambanks.

In 2008, there was some progress toward treatment of 25 acres of ATV and associated unauthorized ground disturbing uses. Due to continuing problems with user created trails, there is an ongoing backlog of work that may be increasing in extent and severity. We will continue to work toward closing, stabilizing and/or treating illegal trails within a year of their being found, but improved funding and other mechanisms may be needed to achieve this. Currently the extent of the problem remains poorly inventoried, rapidly changing and growing. System trail maintenance has increased and new trails are better designed. Trails are closed for wet weather or other damaging conditions. Temporary or seasonal closures are producing benefits to trail quality and reducing environmental impact and maintenance costs. Many of the horse trails are not receiving the same attention and have issues with user created design, wet soil damage, lack of maintenance and inability to monitor effectively.

There are many opportunities to reduce legacy and ongoing erosion, sediment delivery, aquatic habitat, stream and water quality impacts on the National Forest from private lands through authorizations under the Wyden Amendment. However these typically need funding and technical service time to develop and implement. It is difficult to develop or take advantage of opportunities under the current conditions when funds are limited and continuing needs exist within the National Forest.

Attention to water rights and in-stream flow methodologies and determination is needed to be consistent with plan direction in the future (Goal 2, Objective 2.01). For the last several years, developing a protocol to fit the forest needs was put on hold due to other priorities and lack of funding. There is still no overriding need to obtain this information immediately, but continuing to postpone it indefinitely will insure that the information will not be available when needed to identify and address critical water needs. Funding, increased emphasis and dedicated resources are needed if the intent has not changed.

MQ 16: What are the conditions and trends of riparian area, wetland and floodplain functions and values?

Information

This monitoring question is responsive to goals 3, 4, 8 and 9, objectives 4.01 and 11-OBJ-1 and standards 11-1 thru 11-25. Objective 4.01 is to create and maintain dense understory of native vegetation on 1 to 5 percent of the total riparian corridor during the 10-year planning period.

Objective 11-OBJ-1 is to improve structural diversity and composition within the riparian corridor on 2,000 acres on the piedmont as canebrake habitat restoration.

The monitoring elements are defined as follows:

1. Are management strategies in riparian areas adhering to Forest Plan riparian guidelines? Are conditions in riparian areas or corridors providing for soil conservation, associated habitats and necessary shade and cover for aquatic habitats?
2. Create and maintain a dense understory within riparian corridors. Improve structural diversity and composition within the riparian corridor on the piedmont.
3. Acres of riparian area inventoried for condition (i.e. terrestrial habitat, vegetative composition, woody debris recruitment, and non-native invasive plants).

Results

1. Assessment of riparian condition is typically made during project planning. Occasionally the riparian condition is evaluated and actions initiated to address riparian health and function. Some of these analyses address the presence of unwanted exotic species, lack of woody debris, active erosion from slopes, gullies, unstable or eroding streambanks, excessive sediment, fecal coliform, damage from unmanaged recreational uses, or a desire to restore certain types of native species, such as canebrakes. Projects are designed to maintain riparian/stream vegetation and avoiding activities that contribute to stream bank failure. Areas for canebrake restoration are carefully selected and implemented to limit effects to aquatic habitats and water quality. Herbicide or pesticide uses to address exotic or invasive species are carefully selected and applied to limit effects to streams and non-target organisms.
2. No specific projects were implemented in 2008 to create dense understory conditions or improve/restore structural diversity and composition within riparian corridors. Work proposed in riparian corridors was ancillary to vegetation treatments in upland areas.
3. There was no inventory of riparian areas in 2008.

Findings

1. Forest and district staffs are implementing the riparian prescription. Riparian identification, delineation, functions and values are considered in field assessments. Activities are often adjusted, reduced or eliminated in response to the resources within these areas. Issues are brought forward such as invasive species, undesignated or user created trails, camping, areas affected by actively eroding hillslopes or channels, and associated resource damages are being evaluated for appropriate response. Continuing integrated interaction and periodic review of field implementation of the riparian guidance and prescription is desired.

1. Current riparian conditions need to be more formally assessed in conjunction with upland vegetation treatments and, where possible, to integrate riparian treatments into project design.
2. Riparian current condition assessments/inventories need to be included in the early stages of project planning.

Issue 2. Sustainable Multiple Forest and Range Benefits

Sub-Issue 2.1 – Recreational Opportunities

MQ 9: Are high quality, nature-based recreational experiences being provided, and what are the trends?

Information

This monitoring question is responsive to goals 22 and 23.

The monitoring element is defined as follows:

1. Results and trends in user satisfaction ratings relative to nature-based recreational experiences.

Results

The first National Visitor Use Monitoring (NVUM) survey was completed on the Forest in FY02. Refer to the 2004 Sumter Monitoring Report for the results of the 2002 National Visitor Use Monitoring of the Francis Marion & Sumter National Forests. A new round of visitor use monitoring was conducted on the Forests in FY 2008. The results of the monitoring will be available at the end of FY 2009.

Findings

The 2002 and 2008 NVUM surveys will be used to begin to establish trends in recreation on the National Forests. The results from the 2008 NVUM will be available in the FY 2009 monitoring report.

MQ 10: What are the status and trends of recreational use impacts on the environment?

Information

This monitoring question is responsive to goals 1, 3, 4, 5, 22, and 23, desired condition for management prescription 11 and standards FW-2, FW-10, FW-11, FW-14, FW-70, FW-76, and FW-77.

The monitoring elements are defined as follows:

1. Recreation activities impact to riparian areas and/or water quality.
2. Impacts associated with OHV activities.
3. Are motorized and non-motorized trails being maintained?

Results

1. No significant impacts to riparian areas from recreation activities have been observed through field observation in FY 2008.
2. Biophysical impacts relating to the Chattooga River were assessed in the Biophysical Inventory conducted on the Chattooga Wild and Scenic River corridor and the Ellicott Rock Wilderness in FY07. This inventory accompanies the Chattooga River environmental assessment of boating use above Highway 28. This EA is ongoing. Direction on reducing the biophysical impacts will be generally addressed, and additional monitoring added in this EA.
3. Wet weather closures on OHV trails continue to work well and are serving to mitigate much of the impact these trails have on riparian areas and other areas on or adjacent to the trails.
4. Trail maintenance continues to be a high priority for the recreation program on the Forests and is funded annually through appropriated, recreation fee, and grant dollars (the latter is used almost exclusively for maintaining/reconstructing OHV trails to increase financial and environmental sustainability). We continue to find ways, like volunteer work days and hosts, to leverage our limited resources while reducing the impacts associated with OHV activities.

Findings

1. The policy of closing OHV trails during wet weather conditions has reduced impacts on riparian areas and other natural resources as well as the trail facility itself.
2. Increased emphasis on trail maintenance across the Sumter is paying off. Many of the trails are in the best condition they have ever been in.

MQ 13: Are the scenery and recreational settings changing and why?

Information

This monitoring question is responsive to goals 13, 28 and 30 and Objective 23.02. In the piedmont (Objective 23.02), increase acreage that is at least ½ mile from an open road to 35,000 acres, emphasizing lands blocks that are at least 2,500 contiguous acres in size.

The monitoring elements are defined as follows:

1. Acres of National Forest land that meet or exceed established scenic integrity (SIO) and recreation opportunity spectrum (ROS) objectives.

Results

1. Project and field review of ground disturbing activities were ongoing in FY 08. Proposed projects on the Sumter National Forest met the established SIO standards and ROS objectives.
2. The National Forest acreage that is at least ½ mile from an open road is 44,327 acres. The acreage total has been met but there are only two areas that meet the 2,500 acre block size. More 2,500 acres areas could be created by emphasizing road closure in certain areas.

Findings

1. Ongoing field reviews of projects being implemented are needed to determine that SIO and ROS objectives are being met.
2. More 2,500 acres areas that are at least ½ mile from a road could be created by emphasizing road closure in certain areas.

Sub-Issue 2.2 – Roadless Areas/Wilderness/Wild and Scenic Rivers

MQ 11: What is the status and trend of wilderness character?

Information

This monitoring question is responsive to goals 26 and 27.

The monitoring element is defined as follows:

1. Is visitor use within limits that do not impair wilderness characteristics?

Results

1. A bio-physical impact inventory was completed in FY 07 for the Chattooga Wild and Scenic River and the Ellicott Rock Wilderness. Those findings indicate that visitor use impacts are occurring that could begin to adversely affect wilderness character. Implementation of the Chattooga River EA possibly in FY10 will begin to address these concerns.

Findings

1. At the time of this writing there is no scheduled date for completion of the Chattooga River EA.

MQ 12: What are the status and trend of Wild and Scenic River conditions?

Information

This monitoring question is responsive to goals 1, 28 and 29 as well as compliance with the Wild and Scenic Rivers Act, Clean Water Act and South Carolina Water Quality Standards.

The monitoring elements are defined as follows:

1. Are free-flowing conditions and outstandingly remarkable values being protected for eligible and designated rivers?
2. Are water quality standards being met for eligible and designated rivers?

Results

1. A bio-physical impact inventory was completed in FY 07 for the Chattooga Wild and Scenic River. The inventory documented the miles of designated and user-created trails and the number of sites with erosion problems along the trails with erosion problems. More detailed information is available in the report entitled "*Capacity and Conflict on the Upper Chattooga River – An Integrated Analysis of 2006-2007 Reports*" (Whittaker and Shelby, 2007).

Information about current use levels and future trends were also collected and compiled in FY07 for the Chattooga Wild and Scenic River corridor as part of the Chattooga River Carrying Capacity Analysis. Detailed information and findings are available in the above report.

2. The forest plan and past monitoring have identified issues of elevated fecal coliform beyond standard levels in the lower portions of the Chattooga River, below Stekoa Creek. Substantial detail was discussed in the Sumter Plan Revision relative to this ongoing problem. Because the primary water quality issues of concern are generated in Georgia, the Chattahoochee-Oconee NF has the lead on this issue with our assistance. Interactions have been infrequent, but effective. The Chattooga Coalition has expanded their sampling of the problems, working with the City and County officials in their ongoing efforts to collect fecal coliform data within Stekoa Creek and disseminate information to the public. A National Forest Foundation grant for some of this work is extending the work into the lower Chattooga River below Stekoa Creek.

Since most of the eligible rivers have little monitoring information available, they are data poor as far as water quality. However, the eligible rivers are primarily forested and low road, agricultural and development densities. There is no significant reason to believe that they are outside the normal expectations for wildland water quality standards. At this time, there are no plans to allocate funds and expand the data gathering unless needed for some other reasons.

Findings

1. The findings of the bio-physical inventory indicate that visitor use impacts are occurring. However, at this time outstandingly remarkable values are not being negatively affected. At the time of this writing there is no scheduled date for completion of the Chattooga River EA.
2. Free flowing conditions and outstanding remarkable values are being protected on eligible rivers on the Sumter National Forest.
3. Information available to assess the Wild and Scenic Rivers is probably adequate relative to general water quality issues and questions. The fecal coliform issues in the lower Chattooga River are being assessed further with joint forest involvement and partnership arrangements that are beginning to form.

The lack of water quality and other data for eligible rivers could become an issue at some point. This information could be used to help establish water quality benchmarks or references. Indirect measures could be used to detect changes in land uses or activities within the watersheds that might signal added monitoring of conditions is needed. Other surrogates such as aquatic macroinvertebrates could be used to address change or conditions. The need to acquire information before activities are proposed or occur within these watersheds from outside sources is important to consider.

We have been relying heavily on the assumption that these areas are predominantly within the National Forests. Forest management activities are stewardship and conservation oriented, and generally not major pollution sources that impact water quality, but may contribute as a secondary source of pollutants. We are not aware of any conditions on these rivers where existing problems are already above threshold levels or listed as impaired streams. If we thought any of these areas were headed in that direction or had large expansions in activity levels, added evaluation may be needed. The eligible rivers were selected in part because activities have not caused irreparable change and water quality conditions are generally considered of high quality due to the prevalence of forest conditions. Road density and other ground disturbing practices remain relatively low. The forest and districts will continue to estimate and evaluate proposals for their impact to water quality including assessing impacts to the existing and eligible Wild and Scenic Rivers.

Issues with unauthorized trails of one type or another and camping are increasing, especially near some streams. Where these activities are occurring within designated or eligible wild and scenic rivers, increased attention, monitoring and mitigation are needed. Some of these uses are being evaluated in the upper Chattooga River watershed capacity analysis. If these activities were increasing into the other eligible rivers, added concern and monitoring would be warranted.

Even on designated trails, equestrian uses are also locally causing resource damage that needs ongoing attention and maintenance. User created trails are creating resource issues because they are not properly located, designed, managed or maintained, and they have had no formal cultural, biological or other resource analysis.

The Forest and Districts are actively involved with addressing the issues at hand and complying with BMPs and Forest Standards. A more formalized strategy may be needed on how to handle, limit and/or mitigate specific types of public use issues that are unauthorized and/or causing resource damage. Due to the expanding nature of the unauthorized user created trails, this is becoming a significant problem that needs priority attention. More effort needs to be placed when activities are proposed on private lands, to insure that the water quality and other values are considered.

Sub-Issue 2.3 – Heritage Resources

MQ 14: Are heritage sites protected?

Information

This monitoring question is responsive to goal 31. The forest manages areas with special paleontological, cultural, or heritage characteristics to maintain or restore those characteristics

The monitoring element is defined as follows:

1. Effectiveness of heritage protection measures.

Results

1. The results of site monitoring are presented in Table 2.8.

Table 2.8 Archaeological Sites

| | |
|---------------------------------|----|
| Total number of sites monitored | 50 |
| ARPA investigations | 0 |
| Other vandalism | 5 |
| Damaged by logging | 1 |
| Sites damaged by forest users | 1 |
| Sites damaged by fire | 0 |
| Sites undisturbed | 43 |

Vandals and artifact collectors continue to use metal detectors to search historic sites and remove artifacts. Holes resulting from metal detector use were found at the historic house site 38NE38 on the Enoree Ranger District. A prehistoric lithic scatter site was an unanticipated discovery in areas logged in the Mingo Analysis Area, Compartment 355, Long Cane Ranger District.

Several sites are being damaged by water erosion along the shoreline of the Strom Thurmond Lake on the Long Cane Ranger District. Unauthorized use of woods roads, ATV, horseback riding and bike trails are causing erosion and disturbance on sites. Site 38CS167 was disturbed by a woods road on the Enoree Ranger District. The access road to 38CS124 on the Enoree District was blocked to protect the Woods Family Cemetery. Eight fire lookout towers are historic sites in need of repair, restoration and documentation. Metal detecting and digging for artifacts on historic period sites continues to be a concern.

Findings

1. The Forest needs to develop Heritage Preservation Plans for at risk sites and implement regularly scheduled monitoring. Plowed wildlife openings should be inventoried for heritage resources and any significant sites found should be protected. A Forest Heritage Curation Plan should be developed to assess curatorial needs. The effects on archeological sites due to dispersed recreation should be assessed. Site management plans should be written for priority heritage assets and significant threatened sites.
2. Opportunities should be sought for partnerships with private organizations and individuals to monitor and protect heritage sites.

Issue 3. Organizational Effectiveness

MQ 17: How do actual outputs and services compare with projected levels?

Information

This monitoring question is responsive to goals 14 and 18 and Objective 10B-OBJ-1. Objective 10B-OBJ-1 states provide local economies with 4.7 – 7.4 MMCF of wood products annually.

The monitoring element is defined as follows:

1. Emphasize high quality forest products on the Piedmont.
2. Are roads being maintained, constructed or reconstructed to reduce sediment delivery to water bodies? Provide a transportation system that supplies safe and efficient access for forest users while protecting forest resources.
3. Determine the costs of doing management.
4. Estimate the returns to counties.

Results

1. The Sumter NF sold 3.0 MMCF of forest products for sale in management prescription 10B in FY 08. Total Sumter volume sold (all management prescriptions) in FY 08 was 7.1 MMCF.
2. The roads constructed, reconstructed and maintained are shown in Table 2-9.

Table 2.9 Road Activities

| Activity | Unit of Measure | FY 05 | FY 06 | FY 07 | FY 08 | 10 Year Plan Estimate |
|-----------------------------|------------------------|--------------|--------------|--------------|--------------|------------------------------|
| Road Construction | Miles | 0.0 | 0.0 | 0.2 | 0.0 | 9.0 |
| Road Reconstruction | Miles | 4.3 | 3.6 | 3.2 | 6.0 | 342.0 |
| Timber Roads | Miles | 20.0 | 28.1 | 37.0 | 30.7 | N/A |
| Roads Decommissioned | Miles | 5.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| System Mileage | Miles | 1,059 | 1,062 | 1062 | 1067 | N/A |
| Roads Maintained | Miles | 782 | 734 | 754 | 720 | 8,450 |

- The annual budget is shown in Table 2.10.

Table 2.10 Francis Marion and Sumter National Forests Budget

| Activity | Unit of Measure | FY 04 | FY05 | FY06 | FY07 | FY08 | 10 Year Plan Estimate |
|-----------------|------------------------|--------------|-------------|-------------|-------------|-------------|------------------------------|
| *Annual Budget | MM\$ | 14.1 | 10.8 | 10.6 | 9.4 | 8.3 | N/A |

* The budget allocation includes both the Sumter and Francis Marion National Forests and is not tracked separately. Annual Budget expenditures are adjusted for inflation and do not include any dollars allocated for grants and other specific programs.

- The FY 2008 payments to the 11 counties are displayed in Table 2.11.

Table 2.11 Returns to South Carolina Counties in FY 2008

| County | Full Payment Amount | Percent Title I | Title I | Percent Title II | Title II | Percent Title III | Title III |
|-----------------------|----------------------------|------------------------|----------------|-------------------------|-----------------|--------------------------|------------------|
| Abbeville | \$136,376 | 80% | \$109,101 | 0% | \$0 | 20% | \$27,275.20 |
| Chester | \$72,812 | 100% | \$72,812 | 0% | \$0 | 0% | \$0.00 |
| Edgefield | \$182,127 | 80% | \$145,702 | 0% | \$0 | 20% | \$36,425.40 |
| Fairfield | \$65,122 | 100% | \$65,122 | 0% | \$0 | 0% | \$0.00 |
| Greenwood | \$62,883 | 100% | \$62,883 | 0% | \$0 | 0% | \$0.00 |
| Laurens | \$123,137 | 80% | \$98,510 | 0% | \$0 | 20% | \$24,627.40 |
| Mc Cormick | \$288,618 | 85% | \$245,325 | 0% | \$0 | 15% | \$43,292.70 |
| Newberry | \$332,812 | 85% | \$282,890 | 0% | \$0 | 15% | \$49,921.80 |
| Oconee** | \$470,064 | 85% | \$399,554 | 8% | \$37,605 | 7% | \$32,904.48 |
| Saluda | \$25,698 | 100% | \$25,698 | 0% | \$0 | 0% | \$0.00 |
| Union | \$352,377 | 85% | \$299,520 | 0% | \$0 | 15% | \$52,856.55 |
| South Carolina | \$2,959,387 | | | | | | |

Findings

- Much of the timber offer in FY08 was in management prescriptions other than 10B.
- The road program continues to emphasize the reconstruction of roads to meet the intended traffic volumes safely and lessen the impacts to forest resources. Road designs emphasized mitigating negative impacts to resources with the focus on watershed health and aquatic passage. Significant road reconstruction was completed on FSR # 757 and a design completed for aquatic passage on FSR # 733. System road projects associated with timber sales were mainly for resurfacing, culvert replacement and removal of vegetation encroaching on the roadway. Timber road mileage saw a slight decrease while program road reconstruction increased.
- The Forest continued to assess the backlog of deferred maintenance needs with the focus on open roads classified as maintenance level 3, 4, and 5. The forest completed shift of

approximately 57.0 miles from maintenance level 3 to maintenance level 2. This will help reduce the road maintenance cost in future years but only slightly as most of these roads receive very little maintenance dollars now.

4. Forest road mileage remained steady in FY 08 but the forest anticipates some increases in future years with the addition of roads in newly acquired lands on the Enoree and Long Cane districts. No roads were decommissioned for third year in a row due to other funding requirements.
5. The forest budget has declined sharply from earlier in the decade.
6. On October 3, 2008, the Secure Rural Schools and Community Self-Determination Act of 2000 (Act) was amended and reauthorized in P.L. 110-343. This law ensures that for the next four years (2008 –2011), counties across the country can continue to count on stable transition of payments that provide funding for schools and roads, make additional investments in projects that enhance forest ecosystems and improve cooperative relationships. Under this act payments to counties will gradually decline over the next four years based on sliding scale. With notable exceptions, the Act, as amended, is similar to the original program. The structure and significant elements of Title I have been amended, but Titles II and III remain intact with some changes.
7. Due to changes in the legislation, three counties elected to use Title II funds and the forest is in the process of forming a Resource Advisory Committee. The authority to initiate Title II and III projects terminates on September 30, 2011. Funds not obligated by September 30, 2012, will be returned to the U.S. Treasury.

MQ 18: Are silvicultural requirements of the Forest Plan being met?

Information

This monitoring question is responsive to goals 14 and 18.

The monitoring elements are defined as follows:

1. Are lands being adequately restocked within 5 years of regeneration treatments?

Results

1. Most stands are now regenerated by natural regeneration (seed trees vs. planted seedlings). These stands typically have regeneration far in excess of minimum numbers.

Findings

1. No additional action is needed.

MQ 19: Are Forest Plan objectives and standards being applied and accomplishing their intended purpose?

Information

This monitoring question is responsive to desired conditions, goals, objectives and standards in the plan.

The monitoring elements are defined as follows:

1. Are projects being managed according to requirements and making progress toward achievement of desired condition for vegetation?
2. Management of newly acquired lands.

Results

1. Many projects are now entering the implementation phase, and there will be opportunities to review them in the field to determine if desired conditions are being achieved and if standards are adequate to protect resources.
2. In FY2008, 85 acres were purchased on the Long Cane. The property is in Abbeville County and it provides connectivity to Long Cane Horse Trail along Cedar Springs Road.

Findings

1. An integrated resource review was scheduled for the two piedmont districts, Enoree and Long Cane Ranger Districts, to review specific projects relative to desired conditions, Forest Plan standards and resource effects. Findings will be available in the FY2009 monitoring report.
2. The Sumter landownership adjustment strategy is being implemented and priority areas for acquisition are slowly being acquired.

Chapter 3. FY 2009 – FY 2010 Action Plan and Status

Actions Not Requiring Forest Plan Amendment or Revision

a) **Action:** Baseline acreage, condition and distribution of rare communities on the Forest.

Responsibility: Forest biologists

Date: ongoing

Status: Data on the condition of rare communities on the Forest continues to be collected annually

b) **Action:** Gap creation and forest stand composition changes need to be integrated into silvicultural and other projects.

Responsibility: Forest biologists

Date: ongoing

Status: No projects were implemented in 2008 to create gaps.

c) **Action:** Wetland habitat development and hardwood restoration activities need to be incorporated into silvicultural and other projects on the forest.

Responsibility: Forest biologists

Date: FY09

Status: Most vegetation management projects include release and site-preparation treatments to favor desirable hardwood species (ie. oaks and hickories). No new wetlands have been proposed.

d) **Action:** National Visitor Use Monitoring (NVUM) needs to be redone every 5 years and to establish trends in recreational use.

Responsibility: Forest Landscape Architect.

Date: FY09

Status: Inventory was completed 2008 and should provide trend information when combined with the 2003 information. It is anticipated that the report will be ready in late summer 2009

f) Action: An Integrated Resource Review (IRR) should be conducted on the Enoree and Long Cane Ranger Districts.

Responsibility: Districts and SO.

Date: FY09

Status: An Integrated Resource Review will be completed on June 23-25, 2009 and results will be available in the FY2009 monitoring report.

g) Action: The Forest will work with the State of South Carolina and supply information relative to prescribe burning on the Forest in order to help the State meet air quality standards relative to fine particulates and ozone.

Responsibility: Districts and SO.

Date: FY10

Status: This is on-going. The forest personnel work closely with state personnel in order to help the state meet air quality standards.

h) Action: The Forest will research and develop protocols to monitor bats and frog populations.

Responsibility: SO Wildlife Biologist and Sumter Wildlife Biologist

Date: FY10

Status: This monitoring has been brought forward as a need. Some work on identifying suitable monitoring protocols has been completed.

Actions Which Require Forest Plan Amendment or Revision

A forest plan amendment is needed to update the 8B2 management prescription on the Enoree Ranger District.

References

Alderman, J.M. 2008. Updated freshwater mussel surveys within the Broad River basin for the US Forest Service, Enoree Ranger District. Alderman Environmental Services, Inc. Pittsboro, NC. 127 pp.

Alderman, J.M. 2008. Freshwater mussel surveys within the upper Chattooga River basin for the US Forest Service. Alderman Environmental Services, Inc. Pittsboro, NC. 37 pp.

EPA's AirData Website: <http://www.epa.gov/air/data/index.html>. February 2009.

Jelks, H.L., S.J. Walsh, N.M. Burkhead, S. Contreras-Balderas, E. Diaz-Pardo, D.A. Hendrickson, J. Lyons, N.E. Mandrak, F. McCormick, J.S. Nelson, S.P. Platania, B.A. Porter, C.B. Renaud, J.J. Schmitter-Soto, E.B. Taylor and M.L. Warren, Jr. 2008. Conservation status of imperiled North American freshwater and diadromous fishes. *Fisheries* 33(8):372-407.

Kohlsaatt, T., L. Quattro, and J. Rinehart. 2005. South Carolina comprehensive wildlife conservation strategy 2005-2010. 2005. South Carolina Department of Natural Resources, Columbia, SC. 278 pp.

NatureServe. 2009. NatureServe Explorer: An online encyclopedia of life (web application). Version 6.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed April 20, 2009).

SC DHEC Website: <http://www.scdhec.net/environment/baq/>. February 2009.

Warren Jr., M.L., M.B. Brooks, S.J. Walsh, H.L. Bart, R.C. Cashner, D.A. Etnier, B.J. Freeman, B.R. Kuhajda, R.L. Mayden, H.W. Robison, S.T. Ross, and W.C. Starnes. 2000. Diversity, distribution, and conservation status of the native freshwater fisheries of the Southern United States. *Fisheries* 25(10):7-29.

Williams, J.D., M.L. Warren, Jr., K.S. Cummings, J.L. Harris, and R.J. Neves. 1992. Conservation status of the freshwater mussels of the United States and Canada. *Fisheries* 18(9):6-22.

Appendix A - List of Preparers

The following individuals contributed to this report:

| | |
|-----------------|---|
| Jim Bates | Forest Archaeologist |
| Bill Hansen | Forest Hydrologist |
| Ed Hedgecock | Forest Engineer |
| Dennis Law | Forest Soil Scientist |
| Robert Morgan | Forest Archaeologist |
| Jeff Magniez | Sumter Zone Wildlife Biologist |
| Gary Peters | Forest Wildlife Program Manager |
| Robin Mackie | Forest Ecologist/Botanist |
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| Stephen Wells | Fire, Lands and Minerals Staff Officer |
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| Melanie Pitrolo | Air Resource Specialist |
| Jeanne Riley | Fisheries Program Manager |
| Jim Knibbs | Environmental Coordinator |
| Mary Morrison | Forest Planner |
| Peggy Nadler | Lands Program |

Appendix B - Amendments to Forest Plan

There have been no amendments to the Revised Sumter Land and Resource Management Plan.

Appendix C - Summary of Research Needs

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 type of management is needed to maintain or restore habitat for small whorled pogonia on the Forest (Andrew Pickens Ranger District)?

How can viable populations of Oglethorpe Oak be maintained and managed on the forest (Long Cane Ranger District)?

SUMTER NATIONAL FOREST FISCAL YEAR 2008 MONITORING AND EVALUATION ANNUAL REPORT

COMMENT FORM

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