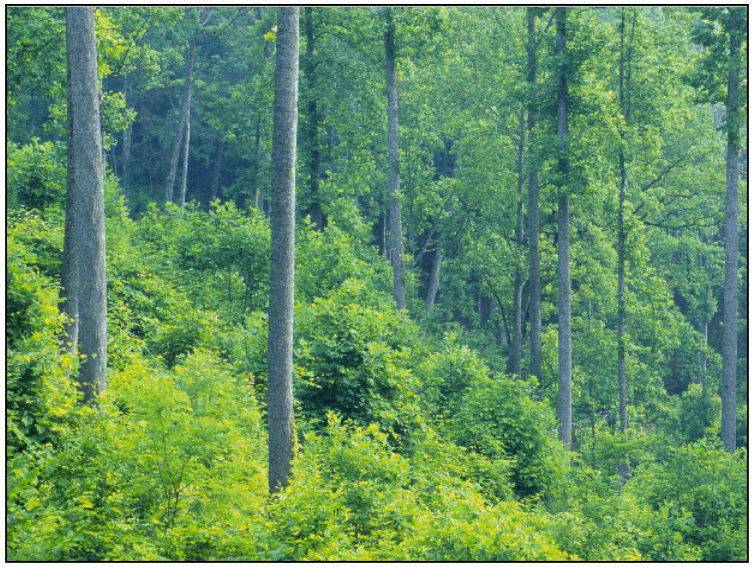
National Forests in North Carolina

FY 2003 Monitoring and Evaluation Report

Nantahala * Pisgah * Uwharrie * Croatan



Two-age Regeneration Area –
Nantahala National Forest

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PREFACE

Cold Mountain, Shining Rock Wilderness – Pisgah National Forest

Forest plan monitoring and evaluation reports are essential elements for maintaining valid, effective and implementable Land and Resource Management Plans (LRMPs). Nantahala and Pisgah National Forests (N/P Forests) operate under an LRMP signed in 1987 and significantly amended (Amendment 5) in 1994. Revision of this plan is set to begin in FY 2006. The LRMP for Uwharrie was signed in 1986 and is scheduled to be revised in FY 2006. The Croatan National Forest LRMP revision was signed in FY 2003. It is available online at http://www.cs.unca.edu/nfsnc/nepa/croatan.htm.

The Annual Monitoring and Evaluation Report for FY 2003 is organized into broad resource topic areas and contains links to additional reports available online. A summary of the historical context for management of the four Forests is available online at http://www.cs.unca.edu/nfsnc/me2003/nfsnchistory.pdf.

The organization of the Monitoring Results for FY 2003 presented here broadly follows three main emphasis areas of the Government Performance and Results Act (GPRA) as outlined in the USDA Forest Service Strategic Plan (2000 Revision). Those emphasis areas are Ecosystem Health, Multiple Benefits to People, and Effective Public Service. See http://www.fs.fed.us/plan.

KEY FINDINGS AND CERTIFICATION

Ecosystem Health

- Forest health issues continue to play a significant role in shaping policies and programs. Infestations of Hemlock Woolly Adelgids are increasing; other insects and diseases are threatening the forests; and there is renewed focus on the need to increase the amount of prescribed fire in the forests.
- Creation of Early Successional Habitat continues to lag well behind the amount anticipated in the Nantahala/Pisgah LRMP.
- An analysis was completed of the relative condition and vulnerability of watersheds across the four National Forests in North Carolina (NFsNC or the Forests). This analysis provides guidance as to where to focus future watershed restoration and maintenance activities and will provide important input into the Uwharrie, Pisgah, and Nantahala Plan revisions scheduled to begin in FY 2006.

Multiple Benefits to People

- The Fee Demonstration program continues to play a huge role in funding maintenance and upgrading of recreational facilities.
- Timber harvest in FY 2003 was less that FY 2002, a reflection of low sales in FY 2002. However timber sales in FY 2003 increased over FY 2002 sales, indicating FY 2004 harvest levels may show an increase. Both sales and harvests remain well below the level anticipated in the LRMP.
- American Indian consultation and coordination have developed into very strong partnership.

Effective Public Service

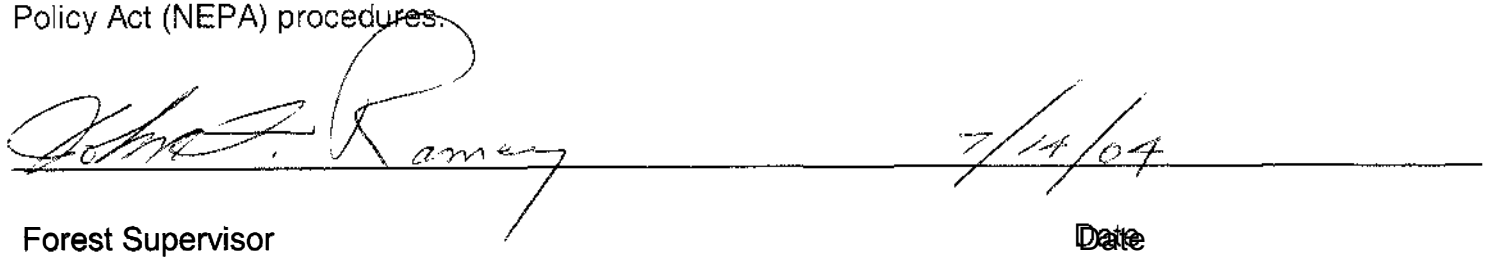
- The Revised Croatan Land and Resource Management Plan was signed in December 2002. The Forests face certain challenges in implementing the plan, especially in regard to objectives for managing off highway vehicle use and road management.
- An analysis of the road system across Nantahala and Pisgah National Forests was completed in FY 2003. This analysis produced a number of findings that have implications for the LRMP revision.
- The Forests began implementing structured prescribed fire monitoring that should make possible a better evaluation of results.

Forest Supervisor's Certification

I have evaluated the monitoring results and I have directed that the Action Plan 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.

During FY 2004, the LRMP's for Nantahala, Pisgah, and Uwharrie National Forests may be amended to better account for policy and funding changes associated with the National Fire Plan and air quality regulations. The revised Croatan National Forest LRMP, signed December 2002, is sufficient to guide forest management for FY 2004.

Any amendments or revisions to the Forest Plans will be made using the appropriate National Environmental Policy Act (NEPA) procedures.



Forest Supervisor

Date

FY 2003 Monitoring Results

Monitoring Results Related to Ecosystem Health

ECOSYSTEM DIVERSITY

Goal or Desired Condition: Maintain, and where possible, enhance the diversity of plant and animal communities.

<table>
<tr><th>Monitoring Item</th><th>Results</th></tr>
<tr><td>Creation of early successional habitat</td><td>
<table>
<tr><th rowspan="2">National Forests in North Carolina</th><th>Regeneration/Early Successional Habitat Created in FY 2003 (acres)</th><th>Desired Annual Amount Established per LRMPs (acres)</th></tr>
<tr><td>Approx. 655</td><td>4,320</td></tr>
</table>
Early Successional Habitat Created Compared to Desired Level
</td></tr>
<tr><td>Status and management of major forest pests and diseases

 
Hemlock Woolly Adelgid on Hemlock Branch</td><td>Hemlock Woolly Adelgid: The first detection of hemlock woolly adelgid (HWA) on the Pisgah and Nantahala National Forests was made in FY 2001 after several years of monitoring. Infested hemlocks are currently found on national forest land in Avery, Buncombe, Caldwell, Mitchell, Madison, Haywood, Transylvania, McDowell, Burke, Clay, Yancey, Graham, Jackson, Macon, and Swain Counties. The level of infestation is heavy in some areas indicating the insect had already been present for 3 to 4 years. More recently, adelgids were detected in Burke County within the national forest boundary. Additional finds in the Chattooga River drainage in South Carolina and Georgia suggest that virtually all of western NC is already, or will soon be, infested. Forest Health Protection (FHP) specialists estimate that mortality will occur within 2 to 3 years in the areas infested for the longest period.

Chemical suppression has been attempted around some administrative sites on many Districts, and experimental releases of the predacious Sasajiscymnus (formerly Pseudoscymnus) beetle have been done in high priority ecological area that are</td></tr>
</table>

Monitoring Item	Results
	infested. Chemical suppression can be effective in maintaining health of specimen trees in ornamental settings, but must be continued indefinitely. Chemical control operations within administrative sites will be expanded as new infestations are discovered. Predator releases have shown promise in some areas and are being expanded, but more work is necessary to determine the long-term efficacy. The small number of predatory beetles available severely limits biocontrol work. To alleviate supply problems, there are currently three rearing facilities in production. The new facilities are located at the NC Department of Agriculture in Cary, NC, the University of Tennessee, and at Clemson University in SC.
 SPB larvae and tunnels	***Southern Pine Beetle (SPB):*** Actual SPB activity was low across all units of the NFsNC. This pattern was consistent with predicted activity except for the Uwharrie. Projections for moderate and increasing activity on that Forest were not realized. Twelve years of forecasting has proven very useful with only 7 incorrect predictions in 48 cases (85 percent correct). There were 26 total SPB spots on districts of the NFsNC in FY2003 with a total estimated affected area of less than 500 acres. This estimate is down from 1500-2000 acres in 2002. Only the Cheoah Ranger District and the Uwharrie National Forest reported SPB spots. Preliminary data indicate that SPB activity will again be low and stable throughout the NFsNC for 2004, continuing the trend that emerged in 2002.
	Oak Decline: Site-specific effects of oak decline and harvesting on forest composition and structure have been monitored on the Cheoah Ranger District since about 1989 as a result of the Grassy Gap and Wesser Timber Sales Environmental Impact Statement (EIS). As a result of The Record of Decision, district and FHP personnel installed about 350 plots for the purpose of monitoring the effects of decline and harvest practices on forest composition and structure. Approximately 200 of these plots were installed for the purpose of predicting post-harvest species composition from pre-harvest advance reproduction. Plot re-measurement was completed during FY 2001. Findings:

Monitoring Item	Results
	* 99 percent of all plots were stocked with tree regeneration. * Half of all plots were stocked with a free-to-grow oak stem. This proportion is close to the oak proportion in the overstory prior to implementation of the timber sale and meets the sale objective of regenerating oak at a level comparable to that present before harvest. * Gains in oak composition were greatest in the stand receiving pre-and post-harvest herbicide treatments designed to maintain and enhance oak composition in the new stand. * Oak composition decreased in two stands with average or better site index that did not receive pre- or post-harvest treatments. * Oak composition was increased in a stand despite being treated with prescribed fire for site preparation, planted to eastern white pine, and the pine released at age 3. This result indicates that oaks can continue to be important components of mixed pine stand composition, even when they are not the primary forest management objective. Oak decline has been shown to reduce oak composition and diversity in severely affected stands, but this monitoring effort demonstrated that oak composition could be maintained or enhanced after harvest with proven and appropriate silvicultural treatments.
 Gypsy Moth larva	***Gypsy Moth:*** There have been three outbreaks detected on NFsNC and adjoining private lands. The first was detected in 1985 on the Tusquitee District followed by one on the Appalachian (Toecane) District in 1993 in the Carolina Hemlocks Recreation Area. Most recently, an outbreak was detected on the Highlands District in 1996. Gypsy moth trapping revealed no established populations on NFsNC during 2003. A single moth was trapped on the Pisgah Ranger District, while 6 moths were collected from 5 different traps on the Croatan. These low levels do not require a management response.

Monitoring Item	Results
	Temporal trends are difficult to establish with only three introductions to National Forest lands in NC, but two have occurred during the past 10 years. As the generally infested area encroaches closer to NFsNC, detections and subsequent eradication projects can be expected to increase. In fact, male moth trap catches in 2001 showed a large increase in infested area on western NC's doorstep in southwestern VA and eastern TN, but this increase did not translate into new infestations in NC over the past 2 years. At historic spread rates and present gypsy moth management regimes, the generally infested area is expected to include the Croatan by the year 2005, the Uwharrie by 2010, and the Pisgah-Nantahala by 2020 (USDA Forest Service, Southern Region, FHP. Forest Health Atlas). However, these estimates may require revision since actual gypsy moth spread rates have lagged behind the historic average for the past several years.
(Status and management of major forest pests and diseases, cont.)	***Other Pests:*** Monitoring efforts are currently underway involving beech bark disease, butternut canker, and dogwood anthracnose in addition to SPB, gypsy moth, oak decline, HWA, and Non-native Invasive Plants. Butternut canker and dogwood anthracnose have changed little in distribution in NC over the past 5-10 years. The situation is different with regard to beech bark disease. Infestations were detected for the first time in FY2003 on the Pisgah (4 loci) and Nantahala (1 locus) National Forests. In addition, around 20 new infestations were detected along the Blue Ridge Parkway where it traverses these forests. All infestations occurred above 4,500' elevation, consistent with distribution of established outbreaks in The Great Smokey Mountains National Park. The increasing number of infestations on the Parkway in close proximity to suitable host type makes additional spread and intensification on National Forest land almost certain.
For complete Report on Forest Health Issues go to http://www.cs.unca.edu/nfsnc/me2003/fh.doc	

Goal or Desired Condition: Attributes and resources of special interest areas including wilderness, research natural areas, and areas registered by the North Carolina Natural Heritage Program are maintained.

Monitoring Item	Results
Attributes and Resources of Wilderness	The Revised Croatan National Forest Plan includes management prescriptions and standards for Sheep Ridge, Pocosin, Pond Pine, and Catfish Lake South Wildernesses, which were revised and updated. The new management prescriptions and standards should better protect the wilderness values of these four Wildernesses.
Attributes and Resources of Wild and Scenic Rivers	Work continued this year on development of a Comprehensive River Management Plan for Wilson Creek. Wilson Creek was designated a National Wild and Scenic River in 2000. Several meetings were held with state and county officials and the public to listen to ideas on how the Forest Service portion of the Wilson Creek corridor should be managed in the future. A draft Comprehensive River Management Plan is anticipated to be available for review by summer 2004.

SPECIES DIVERSITY

Goal or Desired Condition: Maintain viable populations of existing native wildlife, fish, and plants. Threatened and endangered plant and animal species are protected, managed or recovered consistent with the Endangered Species Act; and sensitive species are conserved.

Habitat and population status of Management Indicator Species (MIS)

Game Species

Species	Monitoring Methods	Population Trend from 2002	Overall Population Trend
Black bear	Harvest records and bear bait surveys	Increasing	Increasing
White-tailed deer	Harvest records	Decreasing	Increasing
Ruffed grouse	Harvest records, flush rates, and drumming surveys	Decreasing	Static
Eastern wild turkey	Harvest records and summer brood surveys	Increasing	Increasing

2003 Regional Landbird Strategy

Forest neotropical migratory bird surveys were accomplished through 10-minute point counts on 353 established plots across the National Forests in North Carolina (114 points on the Nantahala NF, 144 points on the Pisgah NF, 55 points on the Uwharrie NF, and 40 points on the Croatan NF) during the spring (May-June 15) of FY2003. A total of 1,876 birds were heard or seen, consisting of 72 species (with 4 districts reporting at this time).

Result of 2003 spring bird monitoring, National Forests in North Carolina (Cheoah, Pisgah, Uwharrie and Croatan Districts reporting).

Species	# Individuals heard/seen during
Acadian Flycatcher	70
American Crow	78
American Goldfinch	27
American Redstart	2
American Robin	27
Bachman's Sparrow	5
Barn Swallow	1
Black-and-white Warbler	22
Blackburnian Warbler	4
Black-billed Cuckoo	3
Black-capped Chickadee	6
Black-throated Blue Warbler	26
Black-throated Green Warbler	20
Blue Jay	23
Blue-gray Gnatcatcher	46
Blue-headed Vireo	10
Brown Thrasher	8
Brown-headed Cowbird	17
Canada Goose	2
Canada Warbler	3
Carolina Chickadee	48
Carolina Wren	140

Carolina Wren	140
Cedar Waxwing	2
Chestnut-sided Warbler	84
Chimney Swift	8
Chipping Sparrow	5
Common Grackle	13
Common Nighthawk	2
Common Raven	1
Common Yellowthroat	182
Dark-eyed Junco	75
Downy Woodpecker	16
Eastern Bluebird	2
Eastern Kingbird	3
Eastern Phoebe	2
Eastern Towhee	264
Eastern Tufted Titmouse	67
Eastern Wood-Pewee	36
European Starling	2
Field Sparrow	2
Fish Crow	7
Golden-crowned Kinglet	39
Golden-winged Warbler	1
Gray Catbird	28
Great Crested Flycatcher	1
Hairy Woodpecker	2
Hooded Warbler	39
Indigo Bunting	58
Kentucky Warbler	3
Least Flycatcher	1
Louisiana Waterthrush	1
Mourning Dove	3
Northern Cardinal	15

Northern Parula	13
Ovenbird	63
Peregrine Falcon	1
Pileated Woodpecker	20
Pine Warbler	17
Prairie Warbler	3
Prothonotary Warbler	1
Red-bellied Woodpecker	8
Red-eyed Vireo	94
Red-headed Woodpecker	9
Rose-breasted Grosbeak	7
Ruby-throated Hummingbird	3
Scarlet Tanager	9
Song Sparrow	20
Summer Tanager	17
Veery	19
White-breasted Nuthatch	2
Winter Wren	6
Wood Thrush	12
Total # Species=72	Total # Birds=1,876

The Regional Landbird Strategy is in place across the southeastern states that comprise the Southern Region of the USDA Forest Service, Trend information, when available, will evaluate populations region-wide.

<table>
<tr>
<td>Habitat and population status of Management Indicator Species (MIS) [cont.]</td>
<td>
2003 Bat Surveys
Forest bat monitoring was accomplished through mist netting of likely travel corridors and foraging areas at eight areas on the Nantahala and Pisgah National Forests during the summer (July-August) of FY2003. These included Big Indian Creek, Buck Creek, Alarka Laurel, Nantahala River Gorge, Jones Creek and Blowing Spring Cave on the Nantahala National Forest, and Steeles Creek and Looking Glass Creek on the Pisgah National Forest. A total of 170 bats were captured, consisting of 6 species.

Result of 2003 summer bat monitoring, Nantahala National Forest.
<table>
<tr><td>Species</td><td># Individuals captured</td></tr>
<tr><td>Eastern Red Bat - Lasiurus borealis</td><td>14</td></tr>
<tr><td>Eastern Pipistrelle - Pipistrellus subflavus</td><td>45</td></tr>
<tr><td>Big Brown Bat - Eptesicus fuscus</td><td>17</td></tr>
<tr><td>Northern Long-eared Bat - Myotis septentrionalis</td><td>63</td></tr>
<tr><td>Little Brown Bat - Myotis lucifugus</td><td>30</td></tr>
<tr><td>Hoary Bat - Lasiurus cinereus</td><td>1</td></tr>
<tr><td>Total # Species=6</td><td>Total # Bats=170</td></tr>
</table>
Note: No additional Myotis sodalis (Indiana Bat) sightings have occurred on NFsNC since 1999.
</td>
</tr>
<tr>
<td>Coldwater stream fish populations trends</td>
<td>Long-term trout population monitoring continued in FY 2003. Monitoring on approximately 20 miles of streams within Nantahala and Pisgah National Forests continues to support earlier findings that while individual populations exhibit high annual variability in age class structure and biomass, overall trends in trout and associated nongame species populations across the Nantahala and Pisgah have remained stable during the last 10 years.</td>
</tr>
<tr>
<td>Odonate Diversity on the Pisgah National Forest</td>
<td>Adult and nymphal odonates (dragonflies and damselflies) were collected from across the Forests during FY 2002 and FY 2003. This large-scale inventory effort continues because of the proportion of odonate species appearing on the rare species list. Many of these species are thought to be on the list due to a lack of survey and habitat association data rather than actual rarity. Analysis and reporting of this information will be available in the FY 2004 M&E Report (or earlier via the NCNHP database).</td>
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</table>

Anadromous and Catadromous Fish Species Utilization of the White Oak River System	**Approximately 12 kilometers of the White Oak River system continued to be monitored in FY 2003.** These studies focused primarily on identifying habitat utilization by the American eel (*Anguilla rostrata*). Eels are thought to influence fish community structure and balance through their competition for habitat and predation. Initial results of this study can be found in the report at http://www.cs.unca.edu/nfsnc/me2003/eels.pdf.
Reservoir Fish Communities	**Long-term monitoring of reservoir fish communities continued on approximately 200 acres of mountain reservoirs in FY 2003.** Reservoirs included in this monitoring are Hiwassee Lake, Fontana Lake, Santeetlah Lake, and Chatuge Lake on the Nantahala National Forest and Badin Lake on the Uwharrie National Forest. Based on the age of the reservoirs and results of long-term population monitoring efforts, it is thought that habitat enhancement is one key to maintaining reservoir fish population stability on the Nantahala National Forest. To this effect, approximately 120 acres of reservoir shoreline habitat were improved on the Nantahala National Forest during FY03. As with coldwater stream fish populations, reservoir fish communities exhibit high annual variability in age class structure and biomass, although **overall trends in reservoir fish species populations have remained stable during the last 10 years.**
Aquatic rare species and habitat	**Approximately 100 miles of stream across the National Forests in North Carolina were evaluated for rare aquatic species presence and suitable habitat during FY 2003.** These inventories were done to maintain compliance with environmental laws and regulations during the NEPA process for forest management activities, as well as to further the science of individual species.
Aquatic invertebrate populations	**Aquatic invertebrate populations were monitored in 20 streams across the Nantahala and Pisgah National Forests.** As with fish populations, aquatic invertebrate populations tend to exhibit high annual variability in community structure and biomass; however, **overall trends in aquatic invertebrate populations across the Nantahala and Pisgah National Forests have remained stable.**
Freshwater mussel populations	**Freshwater mussel populations continue to be monitored in the Little Tennessee and Nolichucky Rivers** through cooperative efforts with the U.S. Fish and Wildlife Service and North Carolina Wildlife Resources Commission to implement the recovery plan for the endangered Appalachian Elktoe (*Alasmidonta raveneliana*). In addition, aquatic habitats suitable for all

	freshwater mussels continue to be inventoried to improve the reliability of mapped species' ranges and distributions across the National Forests in North Carolina. Despite regional declines in some species' populations, no declines have been documented on the Forests. In fact, **the known range and distribution of freshwater mussels on the Forests continues to expand** as inventories of suitable habitat are completed.
Channel habitat conditions	**Aquatic habitat conditions were mapped at the channel unit scale along approximately 20 miles of mountain streams.** Part of this effort was to complete baseline inventories of "reference stream condition", while other miles were part of project-level monitoring. As this database grows in individual records and statistical reliability, it will allow Forest aquatic biologists to make accurate, scientifically valid presentations and decisions about resource conditions and potential effects during the land management process.
Native Species Restoration (brook trout)	**In FY03, the cumulative total of brook trout populations analyzed for strain origin topped 200**. Most of these populations occur on the Nantahala and Pisgah National Forests. To date, it has been determined that approximately 36% of these populations are the strain native to the Southern Appalachian Mountains (often referred to as "speckled trout"), while 10% show evidence of northern strain genetics, and 54 % show evidence of both northern and southern strain genes. These efforts continue as the first steps towards the restoration of native brook trout in North Carolina.

Progress being made toward recovery of T&E Species	**There were 32 Threatened and Endangered species that occur or may occur on the National Forests in North Carolina at the end of FY 2003:** Activities in FY 2003: Coordination with US Fish & Wildlife Service - 9 species (red-cockaded woodpecker, rough-leaved loosestrife, Schweinitz's sunflower, Indiana bat, mountain golden heather, Appalachian elktoe mussel, spotfin chub, Virginia spirea, American alligator, swamp pink) Monitoring – 6 species (red-cockaded woodpecker, rough-leaved loosestrife, Schweinitz's sunflower, mountain golden heather, peregrine falcon, bald eagle) Site protection – 11 species (swamp pink, peregrine falcon, spruce-fir moss spider, noonday snail, Appalachian elktoe mussel, spotfin chub, bald eagle, rough-leaved loosestrife, red-cockaded woodpecker, Schweinitz's sunflower, rock gnome lichen) Habitat restoration – 3 species (red cockaded woodpecker, bog turtle, mountain golden heather) The most recent red-cockaded woodpecker report is available at http://www.cs.unca.edu/nfsnc/me2003/rcw.pdf

Swamp Pink

Status of Threatened and Endangered Animals

ANIMALS	YEAR LISTED	STATUS	ON FORESTS?
Appalachian Elktoe Mussel	1994	E	Occurs
Red Wolf	1967	E	Extirpated
Spotfin Chub	1977	T	Occurs
Peregrine Falcon	1970	T	Occurs
Eastern Cougar	1973	E	May occur
Carolina Northern Flying Squirrel	1985	E	Occurs
Spruce-fir Moss Spider	1995	E	Occurs
Noonday Snail	1978	T	Occurs
Indiana Bat	1967	E	Occurs
Little-Wing Pearly Mussel	1988	E	Occurs
Virginia Big-eared Bat	1979	E	May occur
Red cockaded Woodpecker	1970	E	Occurs
Bald Eagle	1967	T	Occurs
American Alligator	1967	TSA*	Occurs
Bog turtle	1997	TSA*	Occurs

*Threatened due to similarity in appearance to another species.

Status of Threatened and Endangered Plants

PLANTS	YEAR LISTED	STATUS	ON FORESTS?
Sensitive Jointvetch	1992	T	May occur
Spreading Avens	1990	E	Occurs
Swamp Pink	1988	T	Occurs
Dwarf-flowered Heartleaf	1989	T	May occur
Mountain Bluet	1990	E	Occurs
Mountain Golden Heather	1980	T	Occurs
Small Whorled Pogonia	1982	E	Occurs
Heller's Blazingstar	1987	T	Occurs
Bunched Arrowhead	1979	E	May occur
Mountain Sweet Pitcher Plant	1988	E	May occur
Green Pitcher Plant	1979	E	May occur
White Irisette	1991	E	May occur
Blueridge Goldenrod	1985	T	Occurs
Rough-leaved Loosestrife	1987	E	Occurs

Schweinitz's Sunflower	1991	E	Occurs
Virginia Spirea	1990	T	Occurs
Rock Gnome Lichen	1995	E	Occurs

WATERSHED CONDITIONS

Goal or Desired Condition: Riparian areas, flood plains, wetlands, and their existing ecosystems are perpetuated and enhanced. Water quality and soil productivity are maintained.

SPECIAL REPORT: EVALUATION OF WATERSHED INTEGRITY

The National Forests in North Carolina (NFsNC) have land in 187 different 6th level watersheds (HUCs). These watersheds were assessed for their relative condition and vulnerability. Each watershed was assigned a classification of one of four states: Good condition and high vulnerability; good condition and low vulnerability; poor condition and high vulnerability; and poor condition and low vulnerability. The terms "good/poor" and "high/low" are used as **relative comparisons among these 187 watersheds only** and not relative to any other watershed in the State.

When possible, those watersheds with good condition and high vulnerability should be given first priority for Forest Service management activities aimed at improving watershed condition.

The complete report is available at http://www.cs.unca.edu/nfsnc/me2003/ewap.pdf

FINAL REPORT: LARMAN FIRE BURNED AREA EMERGENCY RECOVERY MONITORING

Purpose of Monitoring: The Larman fire occurred on 2,626 acres of the Hot Springs Unit of the Appalachian Ranger District, Pisgah National Forest, in the fall fire season of 2001. Heavy fuel loadings in southern pine beetle infested timber stands and extreme heat generated by the wildfire consumed the

organic layer of the soil leaving areas of exposed mineral soil. These areas vary in size due to the vegetation type, aspect, fire behavior and steepness of slopes.

Several drainages and streams are in the burned areas that are tributaries to the French Broad River, in particular the Murray Branch drainage. On the western and southwestern aspects near ridge tops the soils are very shallow (coarse loamy) with rock outcroppings scattered across the topography. Recovery treatments are designed to reduce visible soil movement, especially into streams.

The treatment area is located upslope to private property, homes and state access roads. Monitoring would evaluate if cumulative treatments are successful, and provide a means of measuring the effectiveness of treatment methods prescribed.

Hydro seeding, helicopter seeding, and naturally occurring seeding displayed variation in the density and speed of revegetation, with naturally occurring seeding showing less dense and less rapid regrowth. However, none of the plots had any visible soil movement, and streams near each plot all ran clear throughout the monitoring period, even after heavy rain. The final report is available at http://www.cs.unca.edu/nfsnc/me2003/larman.pdf

Monitoring Item	**Results**
Changes in Land Productivity	Soil and water improvements were accomplished on approximately 42 acres. This work included closure/restoration of more than 12 miles (estimated) of old roads or trails and several miles of open road runoff control. While there were no formal partnership agreements for the work accomplished during the fiscal year, the NC Department of Transportation and the NC Wildlife Resources Commission contributed some materials and/or expertise during Phases I and II (FYs 02 and 03, respectively) of the Steels Creek soil and water improvement project work. Much of the Steels Creek project work was rehabilitation of areas/sites damaged by high levels of dispersed recreation use in riparian areas; the work included elimination of streamside traffic to allow natural recovery of some areas. Although there were no Emergency Watershed Protection (EWP) funds available, damages referred to collectively as the *Graham County Landslides* (~7 acres) would have qualified for treatment with such funding. During a period of high soil moisture

	content from high antecedent rainfall, a single storm of approximately 10 inches on May 5-6, 2003 triggered numerous landslides – primarily debris avalanches -- in Graham County, NC. South of Robbinsville (Robbinsville quadrangle), significant debris avalanches occurred on National Forest lands in the Burgan Creek and Rock Creek subwatersheds (tributaries of Long Creek that are used as water supply for the Town of Robbinsville) and elsewhere within the Long Creek watershed. To the west of Robbinsville and north of the Cherohala Skyway (Santeetlah Creek quadrangle), significant debris avalanches occurred on National Forest lands in the Hooper Cove, Cedar Cove, and Shute Cove tributaries of Santeetlah Creek. Emergency Relief for Federally Owned Roads (ERFO) funding has been "approved for eligible repairs subject to availability" to address the extensive damages to the transportation system that also occurred during this incident. The ERFO funds have not yet been allocated. Although the headward areas of some of the *Graham County Landslides* that are adjacent to (and pose further threat to) damaged road segments may be treated in conjunction with the approved ERFO work once the funds are received, the opportunity for timely attention to the more immediate/urgent needs has been forgone. (Most likely, the time lapse prior to any treatment will exceed the limit imposed for non-exigency EWP situations.) The landslide path and runout areas should be evaluated to determine needs for further action. Research plots on the Croatan that were established as a part of the Long Term Soil Productivity Study (LTSP) network attained ten years of age during the reporting period. The LTSP is a major research endeavor that will yield valuable information on the effects of forest management over a period of several decades (see http://www.fs.fed.us/research/pdf/SoilProd.pdf).

Monitoring Results Related to Multiple Benefits to People

OUTDOOR RECREATION

Desired Condition: Protect the beauty of the Forests through special attention to visually sensitive areas and careful application of resource management activities.

Desired Condition: Provide different environmental and social settings for outdoor recreation opportunities that range from primitive to developed. Provide for a variety of recreational activities appropriate to these settings and the forest environment. Provide all recreation visitors to the National Forests the opportunity to participate in activities and programs and use facilities to the highest level of access practicable.

Monitoring Item	Results
Amount and Types of Recreation Use	**The Fee Demonstration Program** continues to support forest recreation. As appropriated funding has dropped over the last decade, the fee demo program has become increasingly important in allowing the forest to maintain existing services and fund site improvements. In FY 2003, the $1,125,000 collected in fee demo helped to fund the following projects: * Roan Mountain - Replaced roof on toilet. *Silvermine Campground (CG) -Replaced access to toilet; replaced landscaping; repaired creek crossing; installed toilet vent stack fans; replaced picnic table; hazard tree removal; some routine maintenance. *Rocky Bluff CG - Repaired host trailer; replaced stone surfacing in campsites; replaced toilets; hazard tree removal; some routine maintenance. * Harmon Den CG - Replaced rock on interior loop trail; hazard tree removal; some routine maintenance. *Tsali CG - Removed hazard trees; planning and design for toilet replacement and addition; buried powerline; replaced fence and parking barrriers; reconstructed fee area; removed host trailer. *Tsali Trailhead (TH) - Extensive hazard tree removal; heavy trail maintenance; trail relocation; trail bridge construction. *Swan Cabin - Hazard tree removal; window replacement; planning for access.

Monitoring Item	Results
	*Rattler Ford Group CG - Reconstructed 3 of 4 group sites; reroofed bathhouse and shed; installed accessible hydrants and removed hazard trees. *Horse Cove CG - Reconstructed fee station; installed new entrance signs and replaced water system with well, well house, reservoir and generator. *Cheoah Point CG - Reconstructed fee station; installed new entrance signs and removed hazard trees. *Cable Cove CG - Heavy maintenance on 26 campsites. *Cedar Point CG- Replaced 7 tables; repaired toilet plumbing. *Flanners Beach Rec Area - Replaced 3 tables; reconstructed section of interior trail; installed electrical service to 6 sites. *Boone Fork CG - Replaced well pumps. *Brown Mountain OHV - Heavy trail maintenance; paved parking lot; completed rock work. *Whitewater Falls, Dry Falls, Whiteside Mountain, Balsam Lodge - Replaced entrance sign; printed brochure; renovated caretaker cabin; replaced door; improved viewing areas; installed benches; completed NEPA for future actions. *Cradle of Forestry - Provided interpretive service/conservation education for 7,000 students and 50,000 visitors. *Sliding Rock - Replaced waterline; replaced fence; improved access to lifeguard station. *Jackrabbit CG- Upgraded wastewater treatment plant and water system; replaced swimming buoys; improved beach; replaced 6 tables, 6 grills, 6 lantern posts; replaced 2 trash receptacles; increased Forest Service presence at site. *Hanging Dog Rec Area - Replaced 7 tables, 5 tent pads, 8 grills; 7 lantern posts; extensive hazard tree removal; repaired host trailer; replaced fixtures in four toilets; increased Forest Service presence at site. * Tellico OHV area - Installed safety railing at parking lot; landscaping; 15 miles heavy trail maintenance; constructed 10 silt traps; 10 miles of brushing; reconstructed 50 waterbars; maintained 3 bridges; replaced 2 culverts; increased law enforcement. *Badin Lake CG - Began reconstruction of campsites. * Appletree CG - Replaced water system. * Nantahala Gorge - Installed safety fence at Wesser Falls; replaced water pump at

Monitoring Item	Results
	launch site; added pump at Ferebee; extended culverts for public safety; installed 2 accessible bear-proof trash cans; provided toilet at Finger Lakes; installed interpretive display; increased law enforcement presence.

FORESTRY/SILVICULTURE

Goal or Desired Condition: A variety of silvicultural treatments are used to provide a continuous supply of wood products with emphasis on high quality hardwoods.

<table>
<tr><th>Monitoring Item</th><th>Results</th></tr>
<tr><td>Timber Stand Improvements (TSI), FY 2003</td><td>TOTAL for FY 2003 = 1,562 acres
LRMP PROJECTED = 2,487</td></tr>
<tr><td>Acres Harvested in FY 2003 by Method, and LRMP Projected Harvest</td><td>
<table>
<tr><th colspan="3">ALL NFsNC FORESTS</th></tr>
<tr><th>Method</th><th>FY 2003 Harvested Acres</th><th>LRMP Projections</th></tr>
<tr><td>Shelterwood/ Two-Aged</td><td>148</td><td>2,767</td></tr>
<tr><td>Uneven-Aged</td><td>11</td><td>500</td></tr>
<tr><td>Thinning</td><td>500</td><td>-</td></tr>
<tr><td>Salvage</td><td>496</td><td>-</td></tr>
<tr><td>Shelterwood Removal</td><td>63</td><td>-</td></tr>
<tr><td>TOTAL</td><td>1,218</td><td>3,267</td></tr>
</table>
Timber harvest decreased from FY 2002 levels.
</td></tr>
</table>

Monitoring Item	Results
Status of Timber Sale Volume in Relation to LRMP Maximum – FY 2003	**Allowable Sale Quantity (ASQ)** / **Volume Offered** / **Volume Sold** **TOTAL = 43 MMBF/Year** / **15.2 MMBF** / **15.1 MMBF** *MMBF = Million Board Feet **Timber sold in FY 2003 was higher than the amount sold in FY 2002.**

HERITAGE RESOURCES

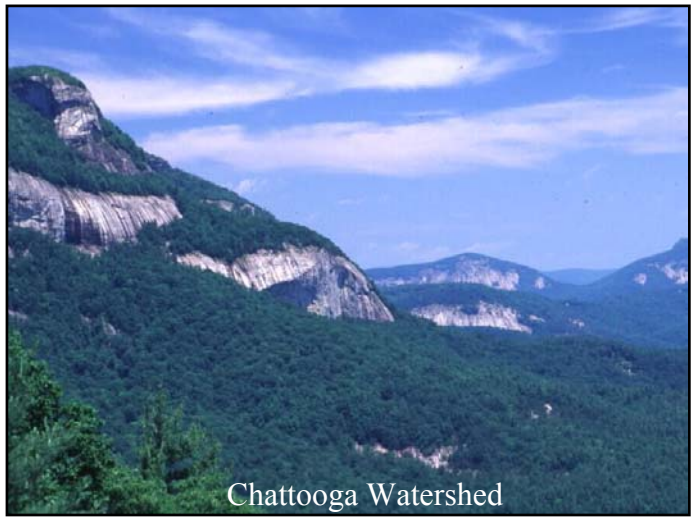
General Direction: Heritage Resources, which are listed on or eligible for the National Register of Historic Places or the National Register of Historic Landmarks, are protected. Suitable sites are developed and/or interpreted for public use and enjoyment.

Rich Mountain Lookout

Monitoring Item	Results		
Heritage Resource Sites Identified in Relation to Acres Surveyed		**Sites & Properties Identified**	**Acres Surveyed**
	FY 2003	**167**	**3,792**
	TOTAL	**5,027**	**171,863**

Monitoring Item	Results
Tribal Relations Activities	American Indian consultation and coordination has improved and developed into a very strong partnership. Continued dialogue, coordination and consultation with American Indians has been positive for all parties, creating increased awareness of issues and concerns. The Forest took the lead in developing a Memorandum of Agreement formalizing government-to-government relationships with the Eastern Band of Cherokee Indians for six National Forests and the Regional Office. The Forest continued to work in partnership with other agencies, American Indian Tribes, local communities and universities on the Trail of Tears and Overmountain Victory National Historic Trails.
Site Protection	Ninety-one (91) heritage resources regarded as susceptible to vandalism or looting, potential impact from project implementation, visitor use, natural deterioration, and/or storm damage were visited and formally assessed and recorded. Overall, implementation of Forest projects, recreation developments, timber harvest, road construction, etc., has not resulted in adverse impacts to heritage resources. However, monitoring has shown that better project implementation coordination is needed for some trail construction and some timber harvest activities when allowed in proximity to archeological sites. Dispersed use, activities, off highway vehicles, horse trails, mountain bike trails, and dispersed camping are impacting significant archeological resources. Impacts were observed at many of these sites, ranging from minor erosion and exposure of features in tree tipups, to vandalism, illegal artifact collection, and illegal metal detection at Civil War sites. In one instance, a log skidder mistakenly crossed a grave, depressing the surface. Increased law enforcement activities have resulted in less impacts in some areas.
To view the complete FY 2003 Heritage Resources Report go to http://www.cs.unca.edu/nfsnc/me2003/arch.pdf.	

Monitoring Results Related to Effective Public Service

Monitoring Item	Results
Land Adjustment in Support of LRMP Goals	**Chattooga Watershed.** Five parcels totaling 204 acres were acquired through land purchase and one exchange during FY 2003 in the Chattooga Watershed area on the Highlands Ranger District. The Chattooga acquisition program, begun in 1992, is a multi-state project involving National Forests in North Carolina, South Carolina, and Georgia. The program's goal is to protect this significant watershed, which includes a federally designated Wild and Scenic River (the Chattooga River), unique rock bluffs, which are home to several federally listed plant and animal species, and a federally designated Wilderness (Ellicott Rock).  Chattooga Watershed **Appalachian Trail.** Five parcels totaling approximately 16 acres were acquired during FY 2003 to protect the Appalachian Trail. Two of the parcels were on the Pisgah National Forest, totaling approximately 7 acres. The other three parcels were on the Nantahala National Forest, totaling 9 acres. 305 miles of the 2,150-mile National Recreation Trail pass through North Carolina. The program goal is to protect the trail and adjacent areas so it can continue to provide hikers with a unique recreation experience. **Other Projects**. Other significant land acquisition projects include the purchase of 2,876 acres of land in McDowell and Burke Counties for the protection of Lake James, on the Grandfather Ranger District of the Pisgah National Forest. Also on the Pisgah

<table>
<tr><th>Monitoring Item</th><th>Results</th></tr>
<tr><td></td><td>National Forest, we acquired a 42-acre inholding on the Appalachian Ranger District.</td></tr>
<tr><td>Special Uses Compatible With LRMP Goals</td><td>Special use authorizations allow for the use of National Forest System lands for a wide variety of purposes. Some authorize facilities and services necessary for public health, welfare, and safety while others authorize uses of a private nature.

In North Carolina we have approximately 1,335 Special Use permits authorizing use of National Forest System lands ranging from small spring developments and driveways to major federal highway systems and gas pipelines.

Of these permits, approximately 1,030 are for land-based uses and 305 permits are for recreation activities such as outfitting, guiding, and whitewater rafting.

Key projects include:

- 35 NC Department of Transportation Projects for the improvement of existing public roads.
- Three Federal Highway projects for major multi-lane highways- Havelock Bypass (Croatan), Corridor K (Cheoah), and NC 215 (Pisgah).
- Relicensing of five hydroelectric projects involving 12 impoundments.

Program emphasis will continue to be the monitoring of existing uses to ensure they are operated and maintained with minimal impact on the land. New applications are managed to ensure they are consistent with the Forest Land and Resource Management Plans and Forest Service Regulations.

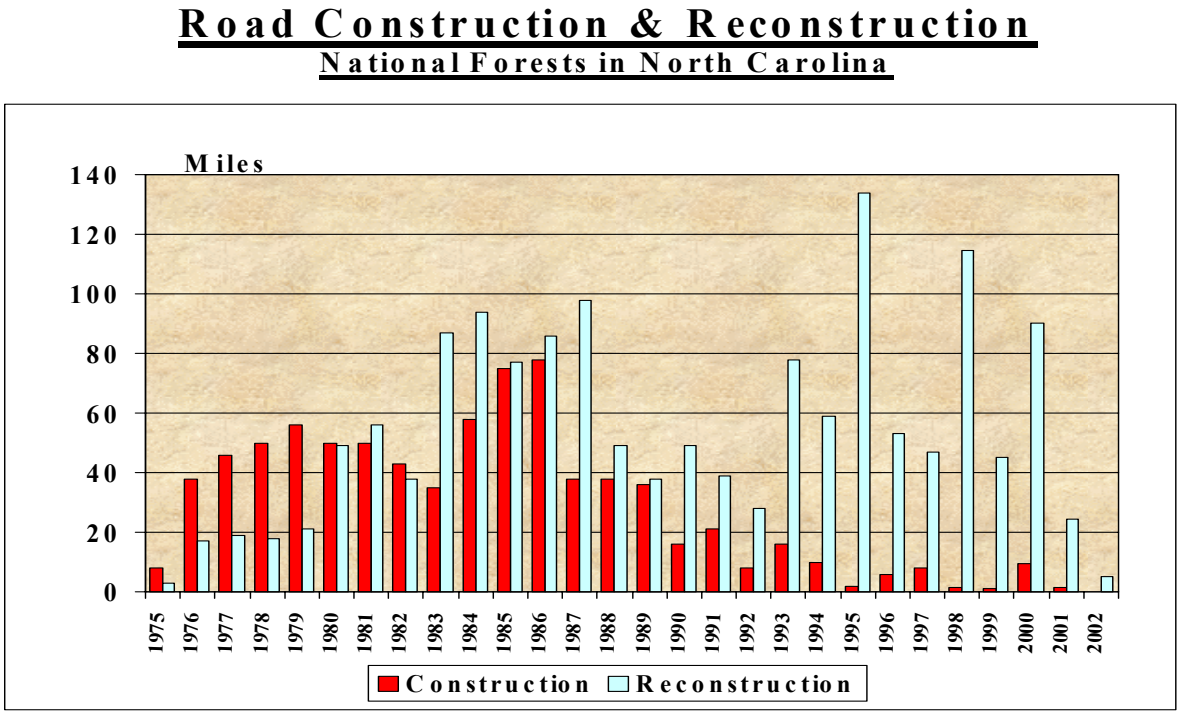
 
Communication Site on the Forest</td></tr>
</table>

Road Management

SPECIAL REPORT: Pisgah and Nantahala National Forest Roads Analysis Process

In January 2003 the National Forests in North Carolina completed an analysis of the open system roads across Nantahala and Pisgah National Forests. Below are some findings from the report. The complete report is available at http://www.cs.unca.edu/nfsnc/roads/roads_report.htm

Forest Service Roads: There are currently 2,348 miles of road under NFsNC jurisdiction. Of this total approximately 800 miles have been constructed during the past 25 years at a rate illustrated by the chart below (approximately 10 % of the miles shown apply to the Croatan and Uwharrie National Forests). Most of these miles were constructed to support commercial timber operations and were gated and closed after the timber harvest was completed. Road construction peaked, along with the timber program, in 1986.



A continuous decrease in the amount of funds available for reconstruction of the collector and arterial roads, the backbone of the Forest Service system, has occurred as purchaser credit has decreased. The result is a continuous and significant increase in deferred maintenance backlog. Reflected in the chart above is a series of catastrophic storms starting in the late 1970s that have necessitated reconstruction of individual local roads during these years.

As of 10/01/2002, approximately 1,052 miles of National Forest System (NFS) roads were inventoried as open to some degree for public access. Six hundred and forty-five (645) miles are always open. Ninety (90) miles have seasonal closures, primarily due to winter weather and related safety considerations, or at developed recreation sites that are closed during the winter. Approximately 242 miles are classified as restricted roads. Seventy-five (75) miles are open seasonally during hunting season. These roads provide restricted access to some administrative, research, and communication sites, access to private in-holdings, and roads that are available by special-use permits such as those providing accessible hunting opportunities.

Thirty-one percent of the total road system (736.4 miles) are managed and maintained for public use with passenger cars. These roads are maintained to varying standards depending on the level of use and management objectives.

Forest Highways and Scenic Byways: Roads under the jurisdiction of the state or other federal agencies provide a critical network of highways providing access to and within the National Forests. Many have been recognized as such with special designations that allow for additional funding.

Forest Highways are designated under the Public Lands Highways program of the Transportation Equity Act for the 21st Century (TEA21). Most of these routes on the Nantahala and Pisgah National Forests are state roads. Some are Forest Service roads. Once designated, they qualify for federal funding for improvement or enhancement. There are 57 designated Forest Highway routes totaling almost 550 miles. Forest Highway funding can be used for planning, design, and construction or reconstruction of these designated routes. Over the past 5 years, funding has averaged $1,394,000 per year. Emphasis has been on funding bridge replacements. In most cases the State then funds reconstruction of the road itself.

The National Scenic Byway Program <www.byways.org> was created as a part of the Intermodal Surface Transportation Act of 1991 (ISTEA) to recognize outstanding travel routes that celebrate the pride and diversity of our communities, as well as the stunning landscapes that have shaped our lives. A recognized road must also be considered a "destination unto itself." Once a road has been designated a State Scenic Byway, of which there are 17 in Western North Carolina, then it can be nominated as a National Scenic Byway or All-American Road, which then makes it eligible for funds to enhance the area adjacent to the road. The Blue Ridge Parkway (National Park Service jurisdiction) has been designated as one of only 15 All-American Roads. The Cherohala Skyway (State jurisdiction), running 17 miles through the Nantahala National Forest is one of 66 National Scenic Byways. In addition there are 2 Forest Service National Scenic Byways, the Forest Heritage Scenic Byway (79 miles) on the Pisgah District and the Mountain Waters Scenic Byway (61.3 miles) on the Highlands and Wayah Districts.

Meeting Forest Plan Objectives: In the Land and Resource Management Plan (LRMP) – Amendment 5, Appendix E – Outputs and Activities it states a yearly average of 41.0 miles of construction/reconstruction of local roads and 0.0 miles of arterial or collector roads are expected to occur.

Arterial and collector roads provide primary access to large portions of the National Forest. Arterials normally serve as connections between towns, and state highways and are main thoroughfares through the Forest. Collectors link large areas of the Forest to arterials or other main highways. Local roads provide access to specific locations, such as a developed recreation site or harvest unit. A total of 289 miles (19.3 miles per year) of local roads were constructed and 1008 miles, including many collector roads, were reconstructed (67.2 miles per year) during the same15-year time period. It is difficult to relate the reported miles of reconstruction with expected outputs in the plan. Most reconstruction occurred as a result of storm damage, where the assumption in the plan did not include storm damage related activities.

Management Areas are used in the LRMP similar to zones in county or city plans. They are developed to document general direction and standards that can be used to achieve different desired conditions on large blocks of Forest Service land. There are 18 management areas, 5 general categories, and 13 site-specific areas designated. Emphasis for each category includes a description of the desired transportation system and guidelines for travel management.

For the five general categories an open road density is specified. The table below illustrates that these standards are not always being met. In some cases they can never be met, even if all Forest Service roads are closed. This is because of the number of miles of road under other jurisdictions will remain open. More site or area specific direction and standards are also included in the LRMP, but should be addressed at the watershed and project scale.

Budget: The overall condition of the forest's classified road system continues to deteriorate because the forest is not adequately funded to operate and maintain these roads to the level they were designed for. The forest receives only 25% of what is needed for annual road maintenance and approximately $48 million is required to correct existing deferred maintenance needs.

Additional Findings: While no roads in this analysis were determined to be unneeded at this time, a number were identified as possible candidates for closure, seasonal closure, or reduced maintenance. These would be the roads with the lowest value scores, and especially those with a corresponding high risk score, that are not required to be open for specific reasons such as providing access to private property.

Road Density Compliance by Management Area

MA	Emphasis	Desired Open Road Density	Acres Exceeding Desired Open Road Density Includes all open Roads State & FS	Acres Exceeding Desired Open Road Density Includes only FS roads	Miles of Open Road needing closure to fully comply with LRMP standards	Acres Exceeding Desired Open Road Density Even if all FS Open Roads were closed
		Miles per Sq mile	Percent	Percent	Miles	Percent
1B	Provide motorized recreation use	2.0	21	21	17	0
2A	Provide motorized recreation use	2.0	60	36	42	16
2C	Provide motorized recreation use	2.0	48	18	26	34
3B	Close most roads to motorized use	0.5	51	25	79	21
4A	Close most roads to motorized use	0.25	70	38	26	44
4C	Close most roads to motorized use	0.25	38	21	34	18
4D	Close most roads to motorized use	0.25	64	47	85	30
5	Close all roads to motorized use	0.00	82	60	20	41

- More than half the open roads were identified as having high value for social uses. These range from providing access to cemeteries, churches and other ceremonial sites, to sustaining traditional uses for minority or low-income groups, to use as a thoroughfare connecting private land with state roads or federal highways.

- While most roads are viewed as having at least moderate value for fire management, a significant number are also perceived as not up to the task of handling the large, heavy vehicles associated with fire fighting in a completely safe manner. Many Forest

roads have infrequent turnouts and few spots where a fire engine could turn around.

- Although open-road-density across the Forests is higher than anticipated in the LRMP, few roads are identified as posing a high risk to wildlife (the open road density standards are set primarily to benefit wildlife). In part, this is due to low traffic volumes on many of these roads.

- While only 2% of roads are in close proximity to a Threatened or Endangered Species, approximately 29% are close to at least one sensitive species or special habitat.

- Twenty percent of the roads are in close proximity to a heritage resource site. These are sites with paleontological, archeological, or historical significance.

- This analysis looked at the 806 miles classified as the open road system. However, impacts are occurring on the 2000+ miles of closed roads and on the estimated 700+ miles of unclassified roads. All unclassified roads will be identified using GPS technology and added to the Transportation Atlas in the next few years. Where appropriate, watershed scale analysis will look at both the closed and unclassified roads. Priorities for watershed scale analysis should consider those watersheds that are the most vulnerable and can benefit the most from road investments.

Fire Management

Monitoring Item	Results
National Fire Plan Accomplishments for FY 2003	Southern Region prescribed fire managers were presented with challenges throughout 2003. Rainfall events were so persistent and repetitive in some areas that finding a prescription window was close to impossible. The Columbia Shuttle Recovery incident, Western fires, and Hurricane Isabel took a heavy toll on the Southern Region prescribed fire program. The challenges notwithstanding, Southern Region fire managers treated more acres than in 2002. The National Forests in North Carolina treated 22,335 acres with prescribed fire for fuel reduction. During 2003 the Forests experienced 46 wildfires that burned a total of 220 acres. Almost all the burned acres were the result of debris burning on private land that got out

	of control. The 2003 Asheville Hotshots, an Interagency Type I crew, consisted of seventeen employees from the Forest Service, Park Service, and Bureau of Indian Affairs, detailed from January 12th through May 17th. They were dispatched to 9 wildfires, 11 prescribed burns, and spent 35 days working on the Columbia Shuttle Recovery effort in Nacogdoches, Texas. A new system for monitoring prescribed burns is now in place, utilizing photo points. Digital photos would be taken pre- and post-burn, as well as at successive intervals following the burn, to more effectively document conditions, results, and regrowth. Below are examples of pre- and post-burn photo point documentation.

←Pre-Burn

Post-Burn →

Action Plan

FY 2004/2005 Action Plan

The following actions are needed to respond to monitoring results from FY 2003:

1) **Develop a plan to respond to the increasing threat from Hemlock Woolly Adelgid.**

Status of FY 2003 Action Plan

The action plan items listed in the previous M&E Report are listed below along with a current status update.

1) Complete Croatan LRMP Revision.

STATUS: Croatan LRMP Revision was signed in FY 2003.

2) Amend the Nantahala/Pisgah and Uwharrie LRMPs to better correspond with the National Fire Plan.

STATUS: Carry forward to FY 2004/2005

3) Fill a third zone NEPA planner position. This should increase the Forest's ability to meet the silvicultural objectives outlined in the LRMPs.

STATUS: No action

4) Devise a system for updating the habitat information contained in the MIS Report completed in 2001.

STATUS: No action

5) Develop a prototype Environmental Assessment and Biological Evaluation to facilitate development of adequate NEPA documents.

STATUS: EA/BE Prototypes were developed and are in use.

LIST OF PREPARERS

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