National Forests in North Carolina

FY 2002 Monitoring and Evaluation Report

Nantahala * Pisgah * Uwharrie * Croatan

Badin Lake, Uwharrie National Forest

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CONTENTS

PREFACE

Croatan 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. The LRMP for Uwharrie and Croatan National Forests was signed in 1986. The Croatan National Forest LRMP was under revision in FY 2002.

The Annual Monitoring and Evaluation Report for FY 2002 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/me2002/nfsnchistory.pdf.

The organization of the Monitoring Results for FY 2002 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

- Creation of Early Successional Habitat during FY 2002 was approximately 20% of the amount projected in the LRMPs.
- Small patches of potential old growth continue to be designated through project level decisions.
- Hemlock woolly adelgid is now recognized as infecting virtually all of western North Carolina and mortality of hemlock trees is expected to begin within two or three years.
- A new study of Non-native Invasive Species (NIS) was completed. In roadside plots, 71% had NIS plants. In plots 100 feet inside the forest edge plots with NIS plants dropped to 18%. Findings from this study can contribute to development of a strategy for minimizing the impact and spread of NIS.

Multiple Benefits to People

- As appropriated funding has dropped over the last decade, the fee program has become increasingly important in allowing the Forest to maintain existing services and improvements. There is broad public support for the fee program in North Carolina.
- Timber production continues to occur on fewer acres annually than projected in the LRMPs.
- Partnerships with the Eastern Band of Cherokee Indians are promoting valuable heritage resource surveys.
- Structural historical resources continue to deteriorate.

Effective Public Service

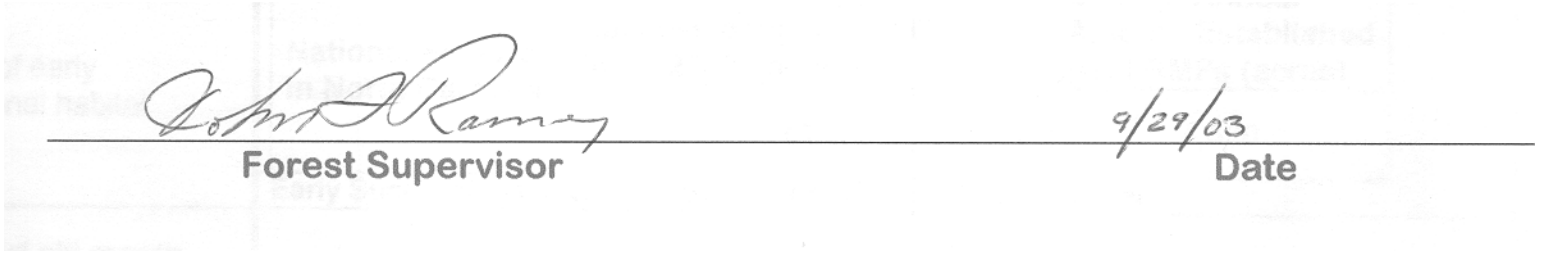
- Significant land purchases during FY 2002 included 459 acres for protection of the Appalachian Trail and 602 acres on the Linville River for the protection of Lake James.
- The Forest continued to make progress in implementing the National Fire Plan.

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.

The LRMPs are sufficient to guide forest management for FY 2003, unless ongoing monitoring and evaluation identify further need for change.

Any amendments or revisions to the Forest Plans will be made using the appropriate NEPA procedures.



FY 2002 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 2002 (acres)</th><th>Desired Annual Amount Established per LRMPs (acres)</th></tr>
<tr><td>811</td><td>4,320</td></tr>
</table>
Early Successional Habitat Created Compared to Desired Level
</td></tr>
<tr><td>Selection of old growth restoration areas per plan direction</td><td>During FY 2002, approximately 926 acres in 16 small patches were designated for development of future old growth.</td></tr>
<tr><td>Status and management of major forest pests and diseases*</td><td>Hemlock Woolly Adelgid: The first detection of hemlock wooly adelgid (HWA) on the Pisgah and Nantahala National Forests was made in FY 2001 after several years of monitoring. Infested hemlocks were found on national forest land in Yancey, Graham, Jackson, Macon, and Swain Counties. The level of infestation was heavy in some areas indicating the insect had already been present for 3 to 4 years. A more recent introduction was detected in Burke County within the national forest boundary. An additional find in the Chattooga River drainage in South Carolina suggests that virtually all of western NC is already, or will soon be infested. 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 the</td></tr>
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Monitoring Item	Results
	Cheoah Ranger District, and an experimental release of the predacious *Pseudoscymnus* beetle has been done in a generally infested forest area. Predator releases have shown promise in some areas. The small number of predatory beetles available severely limits biocontrol work.
(Status and management of major forest pests and diseases, cont.)	***Southern Pine Beetle:*** SPB activity was low in the Piedmont and coastal plain Forests during FY 2002, continuing the trend of relative quiet since 1998. The SPB was more active over the Pisgah-Nantahala, also continuing the trend that started during the later months of 1999 in the mountains. SPB populations have been so high that eastern white pine, not normally considered a host, is being routinely attacked. However, most predictions for mountain districts in FY2002 were for diminishing and stable SPB populations. This proved accurate for the Grandfather and Appalachian Districts, which saw a reduction in activity. Trap catches suggested continued high activity on the Tusquitee District, but it was only moderate. There were 350 total SPB spots on districts of the Pisgah-Nantahala in FY2002 with a total estimated affected area of about 1500-2000 acres, about one-third of that reported for 2001. Preliminary data indicate that SPB activity will be low and stable throughout the NF's in NC for 2003.
(Status and management of major forest pests and diseases, cont.)	***Oak Decline:*** As of 1995, approximately 138,000 of the half a million acres of upland oak type forests on the Nantahala and Pisgah National Forests were classified as either vulnerable to or damaged by oak decline. The advancing age of the upland oak forest results in more and more acres being vulnerable to oak decline. Oak decline susceptibility can be reduced with harvest and regeneration, which decreases the overall age of the upland oak forest. Recent monitoring results indicate that oak composition in regenerated stands can be maintained with appropriate silvicultural treatments.
(Status and management of major forest pests and diseases, cont.)	***Gypsy Moth:*** Only three introductions to National Forest lands in NC have occurred during the past 11 years. Male moth trap catches in southwestern VA and eastern TN during 2001 showed a large increase in infested area. 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 my require revision since actual gypsy moth spread rates have lagged

Monitoring Item	Results
	behind the historic average for the past several years.
(Status and management of major forest pests and diseases, cont.)	***Non-native Invasive Plants:**** A roadside NIS plants survey across 15 selected watersheds was completed in 2002 (Table IV-1). Three monitoring zones, the roadside edge, the edge/forest ecotone, and the interior forest, were surveyed for coverage of NIS plants. All the NIS plants were located within at least one of the watersheds. Of **558** plots analyzed **71%** had invasive exotic species present on the roadside edge. The ecotone and the forest interior provided less suitable habitat for these species. Invasive species were recorded within the ecotone of **51%** of the plots and within **18%** of the forest interior, which was defined as 100 feet from the forest edge. Generally, most of the species did not migrate to the forest interior. *Microstegium vimineum*, by far the most frequently encountered species on the road edge, was illustrative of most species. It was infrequently located within the forest interior even though it was densely covering the road shoulder, sometimes as much as 85%. Typically, when it was located in the forest interior it covered less than 5% of the forest floor.
***For complete Report on Forest Health Issues go to** http://www.cs.unca.edu/nfsnc/me2002/fh.pdf	
****For complete Report on Non-native Invasive Species go to** http://www.cs.unca.edu/nfsnc/me2002/nis.pdf	

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 were revised and updated. The new management prescriptions and standards should better protect the wilderness values of these four Wildernesses.

Monitoring Item	Results
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. At least one more public meeting is planned and a draft Comprehensive River Management Plan is anticipated to be available for review by fall 2003.

SPECIES DIVERSITY

Goal (a.k.a. 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

An extensive analysis of forest community types and special habitats occurred during FY 2001. Each community type and special habitat is associated with one or more MIS. Table 1 lists the biological communities and associated MIS, along with the extent of each community. Table II identifies the special habitat components associated with MIS and identifies the amount of this component and trend, if any is established. Table III shows the communities and special habitat components associated with each MIS and identifies any estimated MIS populations trends.

TABLE I. Forest Community/MIS Associations, Amount of Community Type and Trend , if any.

Biological Community	Forestwide Estimate of Amount of Community	Associated Management Indicator Species
Fraser fir forests	See below (red spruce/fraser fir)	Fraser fir, golden-crowned kinglet, Carolina northern flying squirrel
Red Spruce/fraser fir forests	14,800 ac	Golden crowned kinglet, Carolina northern flying squirrel, solitary vireo
Grassy and heath balds	18 occurrences	Mountain oat-grass, Catawba rhododendron

Biological Community	Forestwide Estimate of Amount of Community	Associated Management Indicator Species
Carolina hemlock bluff forests	6 occurrences	Golden-crowned kinglet, Carolina hemlock
Cove forests	Rich= 107,500 ac Acidic= 174,500 ac Cove(other) =2,800ac	Ginseng, black cherry, buckeye, basswood, solitary (blue-headed) vireo
Oak and oak/hickory forests	High El R.Oak: 40,600 ac Mesic Oak/H: 283,340 ac Dry Mesic Oak/H: 217,000ac	Red oak, white oak, hickories
White pine forests	White pine: 69,000 ac (plantations) WP/Oak : 17,600 ac (natural community)	White pine
Yellow pine mid-successional communities	SP-Oak/heath: 10,200 ac Yellow Pine: 30,377 ac	Pine warbler (low elevational shortleaf/Virginia pine)
Xeric yellow pine forests	29,000 ac 17,400 ac	Pine warbler (pine/oak/heath low elevation habitats) pitch pine, table mountain pine, turkey beard, mid-successional)
Reservoirs	36,000 ac	Index of biotic integrity, largemouth bass, bluegill
Forested seep wetlands	22,000 ac (high prob)	Golden saxifrage, umbrella leaf, mountain lettuce
Bogs	So. App. Bogs: 12 sites Swamp Forest Bogs: 13 sites	*Sphagnum spp.*
Mountain ponds and ephemeral pools	27 ponds/pools (22 ac) 9 Beaver Ponds (3 ac)	Spotted salamander (vernal pools)
Barrens and glades	1 occurrences (300ac)	Prairie dropseed, slender wheatgrass
Shaded rock outcrops and cliffs	66,282 acres (high probability)	Green salamander, Jordan's salamander, alumroots, saxifrages
Open rock outcrops and cliffs	141 occurrences (800 ac)	Raven, peregrine falcon, Biltmore sedge, wretched sedge, mountain oatgrass
Caves		Cave-dwelling bats
Alluvial forests	21,000 ac Alluvial Forest 55,000 ac other floodprone areas	Two-lined salamander, raccoon, mink

Coldwater streams	5,060 mi	Brook, brown, and rainbow trout, blacknose dace, *Cotus spp*.
Coolwater streams	400 mi	Smallmouth bass, white sucker, *Moxostoma spp*., index of biotic integrity
Warmwater streams	210 mi.	Index of biotic integrity, largemouth bass, bluegill

TABLE II. Special Habitat/MIS Associations, Amount of Special Habitat and Trend, if any.

Special Habitat	**Forestwide Estimate Of Amount**	**MIS**
Old Forest Communities (100+ years old)	171,000 ac	Black bear (dens, low levels of disturbance), bats (roosting and foraging habitats in mature forests), pileated woodpecker (cavities, foraging habitat), lung lichens
Early successional (0-10 years old)	26,800 ac (yr 2000) 2040 ac (5 yr av) **Downward trend**	White-tailed deer (all communities and elevations), eastern wild turkey (all communities), ruffed grouse (early and mid-successional all communities) rabbits, rufous-sided (eastern) towhee, bobcat, field sparrow (brushy, riparian thickets)
Early successional (11-20)	46,290 ac (yr 2000) **Peak of upward trend**	Rufous-sided (eastern) towhee, ruffed grouse (early and mid-successional all communities)
Soft mast producing species	High Probability 5,800 ac Downward trend	Wild grape (*vitus spp.)*, cedar waxwing (all communities soft mast)
Hard mast-producing species (>40 yrs)	681,000 ac **Increasing trend**	Black bear, wild turkey, gray squirrel, white-tailed deer
Hard mast-producing species (>40 yrs)	681,000 ac **Increasing trend**	Black bear, wild turkey, gray squirrel, white-tailed deer
Cove forests	Rich coves ac 107,500 ac Acidic cove ac 174,500 ac Other cove +/- 2,800 ac	Ginseng, black cherry, buckeye, basswood, solitary (blue-headed) vireo
Mixed pine/hardwood forest types (successional stage and hard mast)	52,521 **Increasing trend**	Black bear, eastern wild turkey, gray squirrel, white-tailed deer
Contiguous areas with low disturbance (< 1 mile open travelway/4 square miles	160,832 ac	Black bear (all communities)
Contiguous areas with moderate disturbance levels (<1 mile open travelway/2 sq miles	576,240 ac	Eastern wild turkey (all communities)

Large contiguous forest areas	38 Patches (302,000 ac)	Ovenbird (in breeding range, moderately productive sites), northern parula warbler (in breeding range, requires cover and riparian habitats) veery, solitary (blue-headed) vireo
Permanent grass/forb openings	3,000 ac	Eastern wild turkey, eastern meadowlark, rabbits
Den trees (>36" dbh)	See below	Black bear
Small snags and dens	Ave. at 80 yr. Cove= 4/ac Upland=3/ac Pine-2/ac	Gray squirrel, white-breasted nuthatch, yellow-bellied sapsucker
Snags and dens (>22" dbh)	See below	Pileated woodpecker, raccoon
Downed woody debris – all sizes (foraging and cover habitats)	High Accumulation Small wood: 18,000 Large wood: 386,000 Low Accumulation (approx: 600,000)	Black bear, pileated woodpecker, ruffed grouse, Jordan's salamander

Habitat and population status of Management Indicator Species (MIS

Table III. MIS species, estimated trend, and biological community or special habitat indicated by the species

Species	**Estimated Population Trend**	**Indicated Biological Community or Special Habitat Compone**					
Black Bear	Increase	Old Forest Communities	Hard mast-producing	Mixed Pine/hardwood	Contiguous areas with	Den trees	Downed woody
Carolina northern Flying	Static	Fraser Fir Forests	species Red Spruce/fraser	forest types Northern hardwood			
Squirrel			fir	forests			

Species	**Estimated Population**	**Indicated Biological Community or Special Habitat Compone**

Species	Estimated Population Trend	Indicated Biological Community or Special Habitat Compone					
White Tailed Deer	Static To Decreasing	Early-successional (0-10)	Hard mast-producing species	Mixed pine/hardwood forest types			
Raccoon	Increase	Alluvial Forests	Snags and dens (>22 dbh)				
Rabbit	Decrease	Early successional (0-10)	Permanent grass/forb openings				
Gray Squirrel	Static	Hard mast-producing species	Mixed pine/hardwood forest types	Small snags and dens			
Bobcat	Static	Early successional (0-10)					
Mink	Static	Alluvial Forests					
Bats	Varies By Species	Caves	Old Forest Communities				
Pileated Woodpecker	Increase	Old Forest Communities	Snags and dens (>22 dbh)	Downed woody debris – all sizes			
Golden Crowned Kinglet	Decrease	Fraser Fir Forests	Red Spruce/Fraser Fir Forests	Carolina Hemlock bluff forests			
Veery	Static	Large Contiguous Forest Areas					

Species	Estimated Population Trend	Indicated Biological Community or Special Habitat Compone					
Solitary (Blue headed) Vireo	Increase	Red Spruce/Fraser fir Forests	Northern Hardwood Forests	Cove Forests	Large Contiguous forests		
Northern Parula Warbler	Static	Large Contiguous Forest Areas					
Ovenbird	Decrease	Large Contiguous Forest Areas					
Yellow-Bellied Sapsucker	Decrease	Small snags and dens					
Rufous-Sided (Eastern) Towhee	Decrease	Early-successional (0-10)	Early successional (11-20)				
White-breasted Nuthatch	Increase	Small snags and dens					
Cedar Waxwing	Static	Soft mast-producing species					
Pine Warbler	Static	Yellow pine mid-successional forests					
Raven	Static	Open rock outcrops and cliffs					
Field Sparrow	Decrease	Early successional (0-10)					

Species	Estimated Population Trend	Indicated Biological Community or Special Habitat Compone					
Eastern Wild Turkey	Northern Mtns = Increase; Southern Mtns = Decrease	Hard mast-producing species	Mixed pine/hardwood forest types	Contiguous areas with moderate disturbance	Permanent grass/forb openings		
Ruffed Grouse	Static	Early successional (0-10)	Early successional (11-20)	Downed woody debris			
Peregrine Falcon	Increase	Open rock outcrops and cliffs					
Eastern Meadowlark	Absent	Permanent grass/forb openings					
Green Salamander	Static	Shaded rock outcrops and cliffs					
Jordan's Salamander	Static	Shaded rock outcrops and cliffs					
Spotted Salamander	Static	Mountain ponds and ephemeral pools					
Blue Ridge two-lined salamander	Static	Alluvial Forests					
Brook, Brown and Rainbow Trout, sculpin	Static	Coldwater streams					

Species	Estimated Population Trend	Indicated Biological Community or Special Habitat Compone					
Largemouth Bass, Bluegill	Static	Reservoirs					
Blacknose Dace	Static	Coldwater streams					
Freshwater mussels	Varies By Species	Warmwater streams					
Smallmouth Bass, white/redhorses	Static	Coolwater streams	Warmwater streams				
Spotfin Chub	Static	Warmwater streams					
Community	Estimated Trend						
Oak and oak/hickory forests (red oak, white oak, hickory)	Static						
Cove Forests (buckeye, basswood, cherry, ginseng)	Increase						
White Pine Forests	Increase						
Xeric Yellow Pine Forests (pitch & Table Mtn. Pine)	Decrease						
Fraser fir	Decrease						
Grass/Heath Balds	Grassy Balds – Decrease Heath Balds - Increase						

	Species	**Estimated Population Trend**
	Northern Hardwood	Increase
	Non-native Invasives	Increase
	Forested Seeps	Static
	Barrens & Glades	Increase
	Shaded Rock Outcrops	Increase
	Open Rock Outcrops	Downward
	Bogs	Static
Coldwater stream fish populations trends	**Long-term monitoring continued on 8 streams in FY 2002.** Monitoring on 24 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**.	
Odonate Diversity on the Pisgah National Forest	**Adult and nymphal odonates were collected from approximately 200 sites during FY 2002.** This large-scale inventory effort is underway 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. Results of these efforts will be available by the FY 2004 M&E Report. Initial data analysis indicates several pockets of odonate diversity on the Nantahala and Pisgah National Forests.	
Anadromous and Catadromous Fish Species Utilization of the White Oak River System	**Approximately 12 kilometers of the White Oak River system were monitored in FY 2002.** 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. Results of this study can be found in the report at http://www.cs.unca.edu/nfsnc/me2002/eels.pdf .	

Reservoir Fish Communities	**Long-term monitoring of reservoir fish communities continued on approximately 160 acres of mountain reservoirs in FY 2002.** 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 FY02. The same theory is currently being investigated on Badin Lake (Uwharrie National Forest). 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 on the Nantahala and Uwharrie National Forests have remained stable during the last 10 years**
Aquatic rare species and habitat	**Approximately 160 miles of stream across the National Forests in North Carolina were evaluated for rare aquatic species presence and suitable habitat during FY 2002.** 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. In addition, aquatic habitats within approximately 3 miles of stream on the Uwharrie National Forests were evaluated for the suitability of native species introductions in cooperation with the U.S. Fish and Wildlife Service.

Channel habitat conditions	**Aquatic habitat conditions were mapped at the channel unit scale along approximately 25 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.
Progress being made toward recovery of T&E Species	**There were 31 Threatened and Endangered species that occur or may occur on the National Forests in North Carolina at the end of FY 2002:** Peregrine Falcon was downlisted by the US Fish and Wildlife Service from Endangered to Threatened. Activities in FY 2002: Coordination with US Fish & Wildlife Service - 6 species (bald eagle, red-cockaded woodpecker, rough-leaved loosestrife, Schweinitz's sunflower, Indiana bat, mountain golden heather) Monitoring – 5 species Site protection – 15 species Habitat restoration – 3 species Special surveys – 2 species Photo of Rough-leaved loosestrife: To read a report on Loosestrife monitoring on Croatan National Forest go to http://www.cs.unca.edu/nfsnc/me2002/loosestrife.pdf The most recent red-cockaded woodpecker report is available at http://www.cs.unca.edu/nfsnc/me2002/rcw.pdf
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		TSA*	Occurs

*Endangered 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 (a.k.a. Desired Condition): Riparian areas, flood plains, wetlands, and their existing ecosystems are perpetuated and enhanced. Water quality and soil productivity are maintained.

SPECIAL REPORT: LARMAN FIRE BURNED AREA EMERGENCY RECOVERY MONITORING

I. **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. 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.

II. **Type of Monitoring**: Field checks will be performed periodically to look for soil movement and to monitor the growth of vegetation, both natural and planted. Areas seeded by aerial application will be monitored for seed germination results. Photographs will be taken at the fixed plots at different times to document changes in plant growth and soil conditions.

III. **Timing of Monitoring**: Monitoring will occur after each significant rainfall event until soil becomes stabilized. During dry periods, monitoring will occur about once a month.

Monitoring Item	Results
Soil movement and growth of vegetation after wildfire.	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. To read the entire report, go to http://www.cs.unca.edu/nfsnc/me2002/larman_fire.pdf

Plot #1 2/15/02

Plot #1 4/30/02

Both hydro seeding and aerial seeding of annual small-grain cereal rye proved effective in providing temporary ground cover to areas denuded by wildfire until natural regrowth could begin to establish itself. At the end of summer the cereal rye died off, leaving the natural regeneration in place.

Plot #1 6/6/02

Plot #1 8/2/02

Monitoring Item	Results
Changes in Land Productivity	Soil and water improvements were accomplished on approximately 28 acres. This work included closure/restoration of more than 8 miles of old roads or trails and several miles of open road runoff control. The NC Department of Transportation and NC Wildlife Resources Commission contributed some materials and expertise during Phase I of the Steels Creek soil and water improvement project work. Much of Phase I work was rehabilitation of areas damages by high levels of dispersed recreation use in riparian areas. The work included elimination of streamside traffic to allow natural recovery of some areas. There were no events during FY 2002 for which Emergency Watershed Protection (EWP) funds were collected. Research plots on the Croatan National Forest that were established as a part of the Long Term Soil Productivity Study (LTSP) network attained nine years of age during this 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. For more information on LTSP go to http://www.fs.fed.us/research/pdf/SoilProd.pdf
Changes in Land Productivity	**ONSITE monitoring.** ONSITE, a systematic procedure for monitoring and evaluating soil/site disturbances associated with management activities, was reinstituted in FY 2001. No monitored site exceeded acceptable standards for percent areal disturbance. Two units were well within acceptable limits for areal disturbance but warranted follow-up action relative to localized/site specific conditions; those units should be revisited during FY02 to evaluate effectiveness of follow-up action. Considerable work was done toward developing an ACCESS database for ONSITE during FY 2002. A late FY 2003 date is anticipated for the installation of the ONSITE database. Full implementation of the database is anticipated to occur in early FY 2004.

ONSITE DATA FROM FY 2001 and FY 2002

Treatment/Method	# Units	% Avg.	Range	>10%
Commercial Thinning/Rubber-tired Skidder	3	4.7	2.4 to 6.0	0 / 0
Shelterwood/Rubber-tired Skidder	2	5.7	5.5 to 5.9	0 / 0
Shelterwood/Tracked Skidder	1	12.2	NA	0 / 1
Two-age Shelterwood/Skyline Cable	2	7.9	6.5 to 9.2*	0 / 0
Two-age Shelterwood/Rubber-tired Skidder	5	10.2	3.8 to 18.8*	1 / 3

Aug thru Oct 2001 ONSITES on Pisgah, Nantahala, and Uwharrie, including Temporary Disturbances only:

Treatment/Method	# Units	% Avg.	Range	>15%/ >10%
Commercial Thinning/Rubber-tired Skidder	3	4.1	2.4 to 5.8	0 / 0
Shelterwood/Rubber-tired Skidder	2	5.3	4.7 to 5.9	0 / 0
Shelterwood/Tracked Skidder	1	12.2	NA	0 / 1
Two-age Shelterwood/Skyline Cable	2	5.5	1.7 to 9.2*	0 / 0
Two-age Shelterwood/Rubber-tired Skidder	5	6.9	3.8 to 9.3*	0 / 0

* In a few instances, disturbances associated with segments of temporary haul road, skid road, and/or landing that were outside the boundary of an ONSITE unit, but in place for the sole benefit of that unit (serving no other unit or area), were included in the areal disturbance estimates.

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 2002, the $1,200,000 collected in fee demo helped to fund the following projects: ❖ Cable Cove Camp Ground (CG) -Rehab of 26 campsites; six made accessible; replaced septic system and completed streamside rehabilitation. ❖ Horse Cove CG-Installed new water hydrants. ❖ Rattler Ford Group CG-Reroofed storage shed and installed new water hydrants. ❖ Tsali Mountain Bike Trails-Tiled toilet floor, installed new water hydrant, removed trailside vegetation via contract. ❖ Tsali CG-Rehabilitated 9 campsites, replaced three drinking fountains, and removed hundreds of pine trees in CG killed by pine bark beetle infestation. ❖ Boone Fork CG- Rehabilitated 4 campsites. ❖ Brown Mountain OHV Area-Installed 120ft retaining wall; installed steps to water hydrant; installed accessible trail to the picnic shelter, toilet, and hydrant; expanded parking lot and readied for paving; completed 25 miles of trail rehab and 10 miles of trail maintenance including closeout of illegal trails; replaced signs; removed hazard trees; provided on-site presence on all weekends;

Monitoring Item	Results
	increased visitor contacts by 50%. ❖ Whiteside Mountain Scenic Area- Rebuilt trail stairs; constructed new information boards; expanded parking lot; repaired safety fence; increased visitor contacts 40% during peak season. ❖ Balsam Lake Lodge- Began design for revised brochure; renovated caretakers cabin. ❖ Dry Falls – Replaced signs. ❖ Sliding Rock-Provided an additional lifeguard; provided a portable toilet for after hours; added a communication base station for emergencies. ❖ Jackrabbit CG-Replaced 125 ft. of parking barriers, replaced sand at beach, re-roofed toilet building; increased visitor contacts 15%; replaced 5 grills, 3 tables and 5 lantern posts; rehabilitated the water system. ❖ Hanging Dog CG-Replaced 360 ft. parking barriers; regraveled 10 spurs; replaced 5 tables, 5 grills and 5 lantern posts; completed slash cleanup from pine beetle tree removal; increased law enforcement presence by 10%. ❖ Tellico OHV Area- Installed 200 feet of guardrail; improved landscaping; installed access to make toilet accessible; completed 20 miles of trail maintenance; installed 4 culverts; increased law enforcement presence by 20% and increased visitor contacts by 15%. ❖ Appletree Group Camp- Heavy maintenance to failing water system. ❖ Nantahala River-Completed commercial river takeout, graveled and built steps at falls takeout; repaired sewer system; completed interpretive signs for launch site. ❖ Badin Lake OHV- Upgraded all waterbars and lead-off ditches on trail system; repaired fencing; constructed 4 corduroy bridges.

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.

Checking a one-year-old oak seedling. Seedlings were planted to supplement natural regeneration in an area where trees were killed by southern pine beetle.

Monitoring Item

Results

Timber Stand Improvements (TSI), FY 2002

TOTAL for FY 2002 = 1,611 acres
LRMP PROJECTED = 2,487

Acres Harvested in FY 2002 by Method, and LRMP Projected Harvest

ALL NFsNC FORESTS		
Method	**FY 2002 Harvested Acres**	**LRMP Projections**
Shelterwood/ Two-Aged	301	2,767
Uneven-Aged	18	500
Thinning	890	-
Salvage	492	-
Shelterwood Removal	55	-
TOTAL	**1,756**	**3,267**

Timber harvest increased over FY 2001 levels. Harvest continues to occur on less acres annually than projected in the LRMPs.

Status of Timber Sale Volume in Relation to LRMP Maximum – FY 2002

Allowable Sale Quantity (ASQ)	**Volume Offered**	**Volume Sold**
TOTAL = 43 MMBF/Year	**8.4 MMBF**	**5.4 MMBF**

*MMCF = Million Board Feet

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.

Panther Top Lookout

Stewart Cabin

Monitoring Item	Results
Heritage Resource Sites Identified in Relation to Acres Surveyed	**Sites & Properties Identified** / **Acres Surveyed** **FY 2002**: **135** / **4,262** **TOTAL**: **4,860** / **168,071**
Tribal Relations Activities	The Forest Supervisor met with the Chief of the Eastern Band of Cherokee Indians (EBCI) to discuss partnerships and coordination efforts. A partnership was initiated between the Forest and EBCI to locate, preserve, and maintain historic Cherokee cemeteries across the Forest. The Western North Carolina Rock Art Survey was imitated. This is a cooperative effort among the Forest, EBCI, and North Carolina State Historic Preservation Office.

Monitoring Item	Results
	EBCI continued working with the Forest on the National Historic Trail of Tears Survey. The Forest consulted with the ECBI during the Nantahala/Pisgah Forest Scale Roads Analysis. This consultation was to identify roads used to access traditional sites, as well as any roads that could potentially impact Traditional Cultural Properties and Sacred Sites. One road in particular was identified as inappropriate for upgrading due to proximity to a traditional site.
Site Protection	Seventy-seven (77) 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. **Structural historical resources continue to deteriorate at an alarming rate.** Condition assessments need to be completed and maintenance and restoration need to be implemented. National Register of Historic Places listed buildings at the Cradle of Forestry on the Pisgah National Forest are planned and budgeted for this work in FY 2003. The Thornburg House on the Uwharrie Ranger District and the Wilson Lick Ranger Station on the Wayah Ranger District are two other top priorities for the Forest. Others include the Cliffside Complex on the Highlands Ranger District, the Pine Cliff Picnic Shelter on the Croatan Ranger District and Forestwide Civilian Conservation Corps era shelters, bridges and lookouts. 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 camping are impacting significant archeological resources.
To view the complete FY 2002 Heritage Resources Report go to http://www.cs.unca.edu/nfsnc/me2002/arch.pdf	

Monitoring Results Related to Effective Public Service

Monitoring Item	Results
Land Adjustment in Support of LRMP Goals	**Chattooga Watershed.** One parcel totaling six acres was acquired through land exchange during FY 2002 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.** Four parcels totaling 459 acres were purchased during FY 2002 to protect the Appalachian Trail. Two of the parcels were on the Pisgah National Forest, totaling approximately 24 acres. The other two parcels were on the Nantahala National Forest, totaling 435 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 602 acres of land on the Linville River for the protection of Lake James, on the Grandfather Ranger District of the Pisgah National Forest. Also on the Nantahala National Forest, we acquired a 16.67-acre inholding through purchase and an 8.9-acre parcel through

Monitoring Item	Results
	land exchange on Cullasaja River of the Highlands Ranger District.
Special Uses Compatible With LRMP Goals	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 1,359 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 1,022 are for land-based uses and 337 permits are for recreation activities such as outfitting, guiding, and whitewater rafting.  Outfitters Rafting on the Forest Key projects include: - 39 NC Department of Transportation Projects for the improvement of existing public roads. - Three Federal Highway projects for major multi-lane systems - Havelock Bypass (Croatan), Corridor K (Cheoah), 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.

Fire Management

Monitoring Item	Results

National Fire Plan Accomplishments for FY 2002	• Advertised and hired 10 new fire positions
	  ○ 4 firefighters
	  ○ 6 engine operators
	• Completed NEPA for 49,000 acres of fuels treatment by prescribed burning
	• Completed NEPA for 200 acres of fuels treatment by mechanical methods
	• Prescribe burned 25,000 acres for hazardous fuels treatment
	• Conducted fuel treatment on 15,000 acres in the Wildland/Urban Interface (WUI)
	• Coordinated with cooperating agencies on the NFP
	• 2002 Asheville Hotshot Crew developed
	• Negotiated staffing and proposed activities with the Partnership Council
	• Added three and upgraded six fire support vehicles
	• Upgraded the 10 fire engines on the Forest (4x4, diesel and 300 gallons)
	• Updated dispatch radio communications equipment
	• Contracted a helicopter for prescribed burning (Croatan)
	• Contracted a helicopter for fire suppression (Woodlawn)
	• Completed annual fire suppression refresher training for current employees
	• Completed annual physical fitness testing of fire management personnel
	• Completed fire rehabilitation on all controlled wildfires
	• Advertised mechanical fuel reduction contract for 250 acres
	• Staffed the North Carolina Interagency Coordination Center (year-round)
	• Requested funding to upgrade Asheville Air Tanker Base (Asheville Airport)
	• Identified the Fire Fighter Production Capability (FFPC) for the Forest
	• Secured additional firefighting resources (detailers, CWN, and contract)
	• Met the FFPC outlined in NFMAS for fire seasons (MEL)
	• Conducted outreach for pending fire management vacancies
	• Provided for the safety of the public and firefighters
	• Completed and achieved certification of new NFMAS process

FY 2002 Project Monitoring Results

The following projects were reviewed during FY 2002 for adequacy of NEPA documentation and accuracy of implementation:

Uwharrie Ranger District: Duncombe Creek Timber Sale, Flint Hill Timber Sale

Croatan Ranger District: Brown Road Timber Sale and Kuhns Timber Sale

Cheoah Ranger District: Avey Timber Sale, Owensby Timber Sale, Southern Pine Beetle Spots # 133 and #125, Joyce Kilmer Bridge Replacement, Lemmons Branch Boat Ramp

Review of Timber Sales

In general, the timber sales looked good on the ground.

Especially commendable was the thinning around the lake on the Cheoah District, which was very much in keeping with the desired condition and served to enhance the scenery. The individuals responsible for the EA are no longer present on the district. While implementation is good, NEPA documentation on the timber sales could be improved.

On the Croatan, excellent work was performed to reduce the basal area of pines to enhance growth of the best trees. The individuals responsible for the EA are no longer present on the district. While implementation is good, NEPA documentation on the timber sales could be improved.

Recommendations made by the Forest Silviculturist should improve the long-term results from the Uwharrie sales. Individuals who are no longer present on the district did the prescription and EA. NEPA documentation on the timber sales could be improved.

Concurrence from the State Historic Preservation Officer is missing in many of the NEPA documents. This is an area that could be improved with the use of standardized language and a standard EA format, since missing information would be less likely to fall through the cracks.

The NEPA documentation overall needs improvement and could be improved by use of standardized templates or sample documents

With the exception of the southern pine beetle spots, the sales reviewed were from old NEPA decisions, written prior to the recent Inspector General audit of Forest Service timber sales. The NEPA documentation does not meet the current content guidelines. The Review Team recommends further timber sale reviews be delayed until newer EAs can be evaluated. The Forest Leadership Team may want to use the next two or three years to reinstate the Integrated Resource Watershed Reviews, or to focus on other types of LRMP monitoring.

Joyce Kilmer Bridge Replacement

The Forest Plan lists Joyce Kilmer as an exception in Wilderness--trails to be maintained at Level 4. However, the materials used for trail and bridge construction within Wilderness should be compatible with a Wilderness setting--rustic materials (dimensional lumber or metal fasteners should not be visible, etc.).

In general, the review team was struck by the massiveness of the bridge in comparison to its intended purpose as a footbridge in a designated wilderness. The structure itself is in stark contrast to the old bridge which was very rustic and utilized native materials

The Review Team recommends that in the future Districts and SO Engineering consult with the Recreation Shop/Wilderness Program Manager when significant trail work or other management actions are proposed that have the potential of altering wilderness character or use pattern.

The review team consulted with the district ranger and made suggestions for improving the condition and naturalness of trails and footbridges within the Memorial Forest.

Lemmons Branch Boat Ramp

The NEPA documentation was good and there were many other documents in the file that tracked the various stages and changes of this project.

At the site, the contractor consulted with the Forest Hydrologist regarding a recurring runoff problem.

No recommendations or suggestions for improvement.

Action Plan

FY 2003/2004 Action Plan

The following action is needed to respond to monitoring results from FY 2002:

1. Complete Croatan LRMP Revision.

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

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

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

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

Status of FY 2002 Action Plan

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

1) Are all the MIS appropriate considering recent court rulings and clarification of the planning rules pertaining to MIS?

STATUS: Croatan MIS were revised with LRMP Revision. Nantahala, Pisgah, and Uwharrie MIS will be reconsidered during LRMP revision process set to begin in 2005.

2) Should all uninventoried lands be allocated to management areas, and should electronic/communication sites be re-evaluated at the Forest Plan level?

STATUS: Revised Croatan LRMP has designated sites. Nantahala, Pisgah, and Uwharrie may be amended in 2004.

3) With recent changes in EPA standards for air quality, should air quality and prescribed fire objectives be re-evaluated?

STATUS: Croatan Plan revision complete in FY 2003. Nantahala/Pisgah and Uwharrie LRMPs may be amended in FY 2004.

4) Are site-specific consultations adequate for recently listed T&E species?

STATUS: For the Nantahala/Pisgah LRMP, site-specific consultations have been adequate to date. Croatan consultations were completed in FY 2003.

5) Do we have the people with skills in NEPA compliance to meet the workload, and if not, how could we increase our capacity cost effectively?

STATUS: Two zone NEPA positions have been filled.

LIST OF PREPARERS

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M&E Team Members:

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John Blanton - Silviculturist

Steve Oak - Forest pathologist

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