

PLANNED TIMBER SALES

See Appendix C for the 10-year timber sale plan.

This plan is based on current conditions, information, inventories, and silvicultural prescriptions available at the time the Forest Plan was developed. The timber sale plan will be updated annually, by July 1, to reflect the current silvicultural prescription data. This will show the actual compartments, with attendant acreage and volume by harvest method information, to be sold in the upcoming fiscal year.

The actual acres marked for sale may vary somewhat from those shown in the sale plan. Significant changes (20% change in size of individual regeneration area or change in type of cut) will be supported by an amended silvicultural prescription.

TIMBER HARVEST METHODS AND VEGETATION MANAGEMENT PRACTICES

Even-aged harvest methods were used to implement the even-aged silvicultural system. This system was selected by the Forest Interdisciplinary Team as the system best suited to meet the goals of the Plan. The proposed timber volumes and the related resource outputs would not be attained using alternative methods.

Clearcutting was one of the final harvest cutting practices available for selection in the FORPLAN solution. A mixture of final harvest cutting methods was selected with the principal one being clearcutting. On the National Forests in Mississippi clearcutting provided the best mix of resource outputs while meeting the Land Management Plan objectives with the most favorable economics.

Regeneration Harvest - The preferred method of regeneration for the pine working groups is clearcutting followed by planting with improved stock. This allows the forest openings to close in 6-8 years and allows more latitude in distributing future regeneration cuts. Stands scheduled for harvesting will normally have reached culmination of mean annual increment. Exceptions to this would be sparse or low quality stands, species growing off site, or sparse stands where production is so low that carrying the stand to an older age is economically infeasible. Examples are slash pine stands which are off site or which received late first thinnings and never regained their growth momentum.

It is estimated that about 10% of the regeneration in the yellow pine and longleaf pine working groups will be by the seedtree or shelterwood methods. This will occur where sensitive soils, steep slopes, visual quality objectives, or economics indicates natural regeneration would be preferable. Natural regeneration is not an option for the shortleaf or slash pine working groups. These species have erratic seed crops and past experience on the National Forests in Mississippi has shown only spotty success with the method when applied to these species.

The preferred method of regeneration for the hardwood working groups is clearcutting, followed by coppice and advanced seedling regeneration. However, regeneration may be accomplished artificially in some situations where desirable advanced reproduction is not present and cannot reasonably be expected. Approximately 30% of the regeneration in the Delta Hardwood Working Group, will be by shelterwood. This is necessary because of the shortage of desirable advanced reproduction on this old growth forest.

Regeneration practices in the moderate yield slash pine sites will consist of clearcutting followed by site preparation, bedding, as necessary, and fertilization. Hand planting on the beds will be necessary to prevent soil resource damage. The site must be logged and site prepared only during the dry periods of the year.

Management of the moderate yield hardwood (basically bay-maple forest type) group consists of clearcutting the merchantable hardwood sawtimber at age 80 or 90 and leaving the remainder to reach sawtimber size. Past experience has shown these areas restock adequately without site preparation. The low value products from this land class do not justify an intensive site preparation investment. More intensive treatment may raise the water table and eliminate anticipated regeneration.

Intermediate Harvest - Salvage cutting will occur at approximately the current rate unless an unusually severe outbreak of Southern Pine Beetle occurs. Sanitation cutting is usually combined with the intermediate treatments and shouldn't be necessary as an individual practice. Reduced salvage cutting may occur on various management areas to provide the minimum one snag/acre necessary to maintain viable populations of cavity nesters.

Intermediate cuttings will be made in timber stands to promote growth of the "crop" trees and to salvage volume which would otherwise be lost because of natural mortality from over-crowding. Thinning in stands over 50 years of age will occur only to salvage potential natural losses when regeneration is expected to be delayed 20 or more years.

Timber Stand Improvement - Timber stand improvement (TSI) consists primarily of two activities, release and pre-commercial thinning. About 60% of the total projected for the plan is expected to be pre-commercial thinning. The amount of release and pre-commercial thinning needed is directly related to several management factors such as intensity of site preparation, method of regeneration (natural or artificial), size of the regeneration area, initial planting rates, and timing of removal cuts. * Pre-commercial thinning is a planned practice only in the yellow pine and slash pine working groups, and in hardwood stands, where codominant trees of seedling (not sprout) origin are 25 feet or taller it is considered. Pre-commercial thinning is expected to be needed on about 20% of the area regenerated artificially and virtually all of the naturally regenerated stands.* It will be applied to other

working groups on a case by case basis. *Pre-commercial thinning of pine (usually done before age 10 to 15 years) is considered when stem density exceeds the upper level of restocking standards.* The principal method of pre-commercial thinning will be some type of mechanical means at about age three.

Release is expected to be needed on about 10% of the area regenerated in the yellow pine, longleaf, slash pine, and pine-hardwood working groups. The principal method of release is with chemicals applied either directly to the stems by hand, foliar application with liquid by tractor, and pelletized granules applied by air. It is expected that 70% of the chemicals applied under the plan will be by tractor or by air in granulated form.

Site Preparation - Site preparation methods vary with the site requirements, method of regeneration, and working group being regenerated. In the yellow pine working group approximately 50% of the site preparation will be by mechanical means with the balance by chemical application either by hand or tractor, or with granules by air. The use of chemicals would include application by tractor or hand or aerial application of granules.

In the slash, longleaf, and moderate slash pine working group, virtually all site preparation will be by some mechanical means. The intensity would vary between working groups with the longleaf and moderate slash receiving more intensive treatments. Pine site preparation areas frequently receive a combination of treatments involving mechanical, chemical, and fire. The combination that is most cost-effective for an individual site is usually the one selected. Virtually all hardwood site preparation is with hand tools and/or hand tool applied chemicals. Desirable species are cut to encourage sprouts and undesirable and culls are deadened by hand injection of chemicals.

*Safety equipment for Forest Service workers (such as hard hats, eye and ear protection, chaps, and fire retardant clothes) is worn as determined by a Job Hazard Analysis specified in the Health and Safety Code Handbook (FSH 6709.11). This analysis estimates risks to specific body parts and prescribes needed protection.

*Forest Service equipment operators must demonstrate proficiency with the equipment and be licensed to operate it. A helper must direct the operator where safety is compromised by terrain or limited sight distance.

*Herbicides are applied according to labeling information and the site-specific analysis done for the projects. This labeling and analysis are used to choose the herbicide, rate, and application method for the site. They are also used to select measures to protect human and wildlife health, non-target vegetation, water, soil, and threatened, endangered, proposed, and sensitive species. Site conditions may require stricter constraints than those on the label, but labeling standards are never relaxed.

*Only herbicide formulations (active and inert ingredients) and additives registered by EPA and approved by the Forest Service are applied.

*Herbicides and application methods are chosen to minimize risk to human and wildlife health and the environment. The following criteria apply to information in Table II-1 (p. II-42 in the Final EIS):

*Class A herbicide/method combinations are first choice.

*Class B combinations are used only if no Class A herbicide can meet project objectives, and then only if adverse effects are mitigated to acceptable levels.

*Class C combinations are used only if no Class A or B herbicide can meet project objectives, and then only if adverse effects are mitigated to acceptable levels.

*Class D combinations are never used.

*NOTE: The Regional Forester has, in this Record of Decision, strengthened this mitigation as follows: No Class B or C chemical may be used on any project, except with Regional Forester approval. Approval will be granted only if a site-specific analysis shows that no other treatment would be effective and that all adverse health and environmental effects will be fully mitigated.

*Herbicides are applied at the lowest rate effective in meeting project objectives and according to guidelines for protecting human (NRC 1983) and wildlife health (EPA 1986a). Application rate and work time must not exceed typical levels (Appendix A, Tables 4-4 to 4-6) unless a supplementary risk assessment shows that proposed rates do not increase risk to human or wildlife health or the environment beyond standards discussed in Chapter IV. Typical application rates (lb/ac) of active ingredient are:

*	2,4-D/a	2,4-De	2,4-DP	DICAMBA	FOSAMINE	GLYPHOS	HEXAZ	IMAZAPYR
AL	2.0	2.5	3.0		10.0	1.5	1.5	0.75
AG							1.7	
ML	2.5	4.0	4.0	2.0	7.8	1.5	1.7	0.75
MG							1.7	
HG							1.7	
HF	2.0	2.0	1.0	2.0		1.0	1.7	0.75
HB		1.7	1.2					
HS							0.5	
HC	2.0			1.5		1.3		0.75

*	FUEL OIL	LIMONENE	PICLORAM	SULFOMET	TEBUT	TRICLOPYR/a	TRICLOPYR/e
AL	0.5	0.9	0.5	0.13	1.0	3.0	4.0
AG					1.0		
ML	2.0	0.9	0.7	0.17	1.0	4.0	4.0
MG					1.0		
HG							
HF	1.5	0.9	0.4	0.06	4.0	1.4	1.0
HB	1.0	0.9					1.9
HS					4.0		
HC			0.3				

KEY: AL = aerial liquid treatment
AG = aerial granular treatment
ML = mechanical liquid treatment
MG = mechanical granular treatment
HG = manual (hand) granular treatment
HF = manual follar broadcast treatment
HB = manual basal treatment
HS = manual soil-spot treatment
HC = manual cut-surface treatment

GLYPHOS = glyphosate
HEXAZ = hexazinone
SULFOMET = sulfometuron methyl
TEBUT = tebuthiruron
/a = amine formulation
/e = ester formulation

*Method and timing of application are chosen to achieve project objectives while minimizing effects on non-target vegetation and other environmental elements. Selective treatment is preferred over broadcast treatment. Public safety during such uses as viewing, hiking, berry picking, and fuelwood gathering is a priority concern. Application methods from most to least selective are:

- (a) Cut surface treatments
- (b) Basal stem treatments
- (c) Directed follar treatments
- (d) Soil spot (spot around) treatments
- (e) Soil spot (spot grid) treatments
- (f) Manual granular treatments
- (g) Manual/mechanical broadcast treatments
- (h) Helicopter treatments

*Areas are not prescribed burned for at least 30 days after herbicide treatment.

*Weather is monitored and the project is suspended if temperature, humidity, or wind become unfavorable as follows:

*

	<u>Temperatures Higher Than</u>	<u>Humidity Less Than</u>	<u>Wind (at Target) Greater Than</u>
Ground:			
Hand (cut surface)	N.A.	N.A.	N.A.
Hand (other)	98F	20%	15 mph
Mechanical (liquid)	95F	30%	10 mph
Mechanical (granular)	N.A.	N.A.	10 mph
Aerial: Liquid	90F	50%	5 mph
Granular	N.A.	N.A.	8 mph

*Nozzles that produce large droplets or streams of herbicide are used. Nozzles that produce fine droplets are used only for hand treatment where distance from nozzle to target does not exceed 8 feet.

*A certified pesticide applicator supervises each Forest Service application crew and trains crew members in personal safety, proper handling and application of herbicides, and proper disposal of empty containers.

*Each Contracting Officer's Representative (COR), who must ensure compliance on contracted herbicide projects, is a certified pesticide applicator. Contract inspectors are trained in herbicide use, handling, and application.

*Forest Service workers who handle herbicides must wear a long-sleeved shirt and long pants made of tightly woven cloth that must be cleaned daily. They must wear a hard hat with plastic liner, waterproofed boots and gloves, and other safety clothing and equipment required by labeling. They must bring a change of clothes to the field in case their clothes become contaminated.

*Each Forest Service crew must take soap, wash water separate from drinking water, eyewash bottles, and first aid equipment to the field.

*Contractors ensure that their workers use proper protective clothing and safety equipment required by labeling for the herbicide and application method.

*Workers must not walk through areas treated by broadcast foliar methods on the day of application.

*Supervisors must ensure that monitoring is adequate to prevent adverse health effects. Workers displaying unusual sensitivity to

the herbicide in use are medically evaluated and, if tested as sensitive to the herbicide in use, are reassigned to other activities.

*Notice signs (FSH 7109.11) are clearly posted, with special care taken in areas of anticipated visitor use. People living within one-fourth mile of an area to be treated aurally are notified during project planning and shortly before treatment.

*No herbicide is broadcast within 100 feet of private land or 300 feet of a private residence, unless the landowner agrees to closer treatment. Buffers are clearly marked before treatment so applicators can easily see and avoid them.

*No soil-active herbicide is applied within 30 feet of the drip line of non-target vegetation (e.g., den trees, hardwood inclusions, adjacent stands) within or next to the treated area. Side pruning is allowed, but movement of herbicide to the root systems of non-target plants must be avoided. Buffers are clearly marked before treatment so applicators can easily see and avoid them.

*2,4-D, 2,4-DP, and triclopyr are not aurally applied within 300 feet, nor ground-applied within 60 feet, of occupied gray or Indiana bat habitat. The same buffers are used with 2,4-D and 2,4-DP around habitat of the endangered Florida scrub jay, and with 2,4-D around habitat of these sensitive animals: star-nosed mole, Florida mouse, old-field mouse, masked shrew, southeastern shrew, southern pygmy shrew, long-tail shrew, southern water shrew, southern rock vole, and red-backed vole. The same buffers are used with any formulation containing kerosene or diesel oil around habitat of any threatened, endangered, proposed, or sensitive bird during its nesting season. Buffers are clearly marked before treatment so applicators can easily see and avoid them.

*No herbicide is aurally applied within 300 feet, nor ground-applied within 60 feet, of any threatened, endangered, proposed, or sensitive plant. Buffers are clearly marked before treatment so applicators can easily see and avoid them.

*Application equipment, empty herbicide containers, clothes worn during treatment, and skin are not cleaned in open or wells. Mixing and cleaning water must come from a public water supply and be transported in separate labeled containers.

*Aquifers and public water sources are identified and protected. States are consulted to ensure compliance with their ground water protection strategies.

*No herbicide is aurally applied within 100 horizontal feet, nor ground-applied within 30 horizontal feet, of lakes, wetlands, or perennial or intermittent springs and streams. No herbicide is applied within 100 horizontal feet of any public or domestic water source. Selective treatments (which require added site-specific analysis and use of aquatic-labeled herbicides) may occur within

these buffers only to prevent significant environmental damage such as noxious weed infestations. Buffers are clearly marked before treatment so applicators can easily see and avoid them.

*Each aerial herbicide application project must have an operations plan approved by the forest's air safety officer who must ensure that: (a) adequate precautions are taken to protect the crew, including equipment certification and hazard identification; (b) areas to be aeriually treated are clearly marked; and (c) methods used to avoid buffers and other sensitive areas are safe and effective.

*During transport, herbicides, additives, and application equipment are secured to prevent tipping or excess jarring and are carried in a part of the vehicle totally isolated from people, food, clothing, and livestock feed.

*Only the amount of herbicide needed for the day's use is brought to the site. At day's end, all leftover herbicide is returned to storage.

*Herbicide mixing, loading, or cleaning areas in the field are not located within 200 feet of private land, open water or wells, or other sensitive areas.

*During use, equipment to store, transport, mix, or apply herbicides is inspected daily for leaks.

*Containers are reused only for their designated purpose. Empty herbicide containers are disposed of according to 40 CFR 165.9 Group I & II Containers.

*Accident preplanning is done in each site-specific analysis. Emergency spill plans (FSM 2109.12, chapter 30) are prepared. In the unlikely event of a spill, the spill is quickly contained and cleaned up, and appropriate agencies and persons are promptly notified.

*Chain saw operators must be periodically certified and demonstrate proficiency with chain saws.

Forest Service workers must comply with dress and safety standards specified in the Health and Safety Code Handbook (FSH 6709.11).

Table 4-10

VEGETATIVE MANAGEMENT PRACTICES
(Annual Average in First Decade for Suitable Lands)

Practice	Acres
Regeneration Harvest	
Clearcut	17,545
Shelterwood and Seed Tree	
Preparatory Cut	0
Seed Cut	1,191
Removal Cut	1,191
Selection	0
Intermediate Harvest:	
Commercial Thinning	26,054
Salvage/Sanitation	2,100
Timber Stand Improvement	2,835
Reforestation 1/	18,736
Prescribe Burn	166,245

1/ Includes natural and artificial.

Fire by Prescription - Prescribed burning is defined as: Fire applied in a skillful manner to forest fuels, in a definite place, for a specific purpose, under specified weather conditions, to achieve resource management objectives. It is used in all working groups except hardwood. The major uses of prescribed fire are:

--Fuel Reduction - Prescribed fire is the most practical forest management tool to use where dangerous accumulations of fuels build up in stands under even-aged management. Wildfires that burn into areas where fuels have been reduced by prescribed burning result in minimal resource damage. A burning rotation of 3 to 5 years is used for fuel reduction; however, the degree of fire occurrence, risk and fuel buildup will also serve as guides in determining burning intervals.

--Site Preparation - Prescribed burning is used in regenerating pine species by seeding, planting, or natural regeneration. The use of fire exposed mineral soil and controls competing vegetation until the seedlings become established. It is also used as a valuable supplement to mechanical or chemical site preparation.

--Control of Brown Spot Disease - Brown spot disease is a fungal infection that will seriously weaken and eventually kill longleaf pine seedlings. Burning is done when 20 to 30 percent of the seedlings are infected or there is a need to retain the seedlings for satisfactory stocking. The use of fire is the only practical method of controlling this disease. Burning that will remove or scorch the diseased needles without killing the terminal bud is satisfactory.

--Control of Understory Vegetation - This type of burning is used in pine stands to keep understory plants small so they can be easily controlled at regeneration time and to enhance growth of the overstory.

--Wildlife Habitat Improvement - Prescribed burning for wildlife habitat improvement is done in the pine management types. The wildlife featured species are red-cockaded woodpecker, Mississippi sandhill crane, deer, turkey, and quail. The results of burning for wildlife habitat improvement include increase in yield and quality of herbage, legumes, and browse. In addition, openings are created for feeding, travel, dusting, and nesting.

--Range Improvement - Prescribed burning is an important ingredient of grazing in pine types of the Coastal Plains. Immediate plant response is increased palatability, quality, quantity, and availability of grasses and forbs. Dead material low in nutrient values is removed, while new growth, high in protein, phosphorus, and calcium becomes readily available.

--Premarking Burns - Burning off underbrush prior to the sale of forest products improved the efficiency of timber marking and harvesting. The improved visibility and accessibility often increase the stumpage value of the products. Removal of

accumulated material before harvesting provides for safer conditions to forestry personnel.

--Visual Resource Management - Prescribed burning is done to create or maintain open park-like stands for the benefit of the visiting public.

It is readily apparent that a prescribed burn can be used to accomplish more than one resource objective. For example, any prescribed burn always reduces fuel accumulation, and a burn for fuel reduction will generally improve wildlife habitat.

Smoke management and air quality procedures will be practiced in accordance with the Clean Air Act, the state implementation plan, and the Southern Forestry Smoke Management Guidebook.

Timber Harvest Activities on Unsuitable Lands - Harvesting will generally be confined to salvage operations on these lands. Some clearcutting will occur to facilitate military operations on the Black Creek and Biloxi Management Areas. Where suitable areas are present and other resource considerations are not over-riding, firewood permits may be issued. Some specific management activities may take place on these lands when the wildlife biologist recommends a treatment to benefit a threatened, endangered, or sensitive plant or animal species.

OTHER RESOURCE SUMMARIES

RECREATION

RECREATION OPPORTUNITY SPECTRUM

The Forest has been inventoried under the Recreation Opportunity Spectrum (ROS) system. ROS is designed to inventory and manage land by level and type of recreational settings offered. Essentially, each ROS class defines the character of the recreation environment. This inventory revealed the following:

	<u>Acreage</u>	<u>Capacity (RVD's/year)</u>
Semi-Primitive Motorized	43,818	71,402
Roaded Natural	950,419	3,656,710
Rural	<u>145,978</u>	<u>1,012,049</u>
TOTALS	1,140,215	4,740,158

CAMPING

The National Forests in Mississippi are open to camping except where restricted because of resource damage or user conflicts are expected to occur. There are presently 21 areas of developed site camping with fees charged at several of these areas. They include

camp sites, swimming, boating, hiking, and other developed recreation activities. Total capacity is 4,412 PAOT's (people at one time) available for use.

OFF-ROAD VEHICLES

Off-road vehicle (ORV) use on the National Forests in Mississippi occurs mainly on primitive roads and skid trails used in past Logging activities. Cross country travel of ORVs is limited by heavy undergrowth. Most of the ORV's using the Forest employ four-wheel drive, while three-wheel all-terrain cycles are becoming more popular. (See Chapter 5, Table 5-1, page 5-7 of the Monitoring Plan).

The Forest will generally be open to ORV's. In areas of obvious conflict with other uses and in areas where natural resource damage may result from ORV use, the following areas are closed except to administrative use:

1. Developed recreation sites (except for ingress and egress to parking facilities).
2. Wildlife openings.
3. Rights-of-way for electrical transmission lines, pipelines, or telephone lines.
4. Water courses (creeks, streams, etc.). Perpendicular crossing will be allowed if no resource damage occurs.
5. Timber regeneration areas where seedlings are less than ten feet high.
6. Owl Creek Mounds Archaeological Area.
7. Bienville Pines Scenic Area.
8. Harrell Prairie Hill Botanical Area.
9. Shockaloe Horse Trail.
10. Tuxachanie Trail.
11. Black Creek Trail.
12. Big Foot Horse Trail.
13. Witchdance Horse Trail.
14. Marathon Hiking Trail.
15. Delta Research Natural Areas.
16. Ashe Nursery and Erambert Seed Orchard.
17. Black Creek and Leaf Wilderness Areas.
18. Black Creek Corridor.

All roads will be open to motorized vehicle use except when closed by sign, gate, or barrier (including earthen barricades extending the width of the road). A number of local roads are not adequately designed for year-round use. Except for short periods, these roads will be closed to public motorized use. Old woods roads which have been obliterated will be closed to motorized vehicle use. These rehabilitated roads will be signed "Closed to Vehicles." (See Table 5-1 for monitoring of ORV use.)

The Delta National Forest will be closed to ORV use except where it is posted open. The only exception to this rule will be for retrieval of big game which will be permitted with ORV's

Areas that will be closed to ORV's even for retrieval of game are:

Research Natural Areas
Proposed or designated Botanical Areas
Pipelines unless otherwise designated
Water courses
Recreation Areas except for ingress and egress
Wildlife openings
Regeneration areas less than 10 feet tall

TRAILS

There are 133 miles of horse and hiking trails on the National Forests in Mississippi. The trail system will be expanded by constructing the Homochitto Hiking Trail consisting of 20 miles. "Trails South," the field guide for developing, operating, and maintaining trails, will be utilized.

BLACK CREEK WILD AND SCENIC RIVER

The Black Creek has been studied and portions recommended for inclusion in the Wild and Scenic Rivers system. The Black Creek Study Corridor from Big Creek Landing to Old Alexander Bridge will receive special or modified management such as to not impact or degrade the existing environment adversely. If designated by Congress a river management plan will be prepared giving specific direction.

The Department of Interior's inventory of potential wild and scenic rivers listed portions of the Strong River, Tchoutacabouffa, Red Creek, Tuxachanie Creek, and the Homochitto River as candidates for inclusion in this system. They were examined and found to be unsuited. They will be managed according to Forestwide standards for stream management.

WILDERNESS

Two wilderness areas, in Leaf and Black Creek, have been designated by Congress, totaling 5,500 acres. Forty acres of this area is private land.

VISUAL QUALITY OBJECTIVES

Visual Quality Objectives (VQO'S) are met by corridor maintenance, site preparation, timber stand and wildlife habitat improvement, range forage, and fuels treatment projects. The visual quality objectives for the National Forests in Mississippi are listed in the following table "Visual Quality Objective." Under this plan, approximately 1% of the Forest is classified as "preservation" 7% is classified as retention or partial retention, and 92% is "modification" or "maximum modification."

*Treatments are scheduled as much as possible for the season that best meets VQO's. Rehabilitation and enhancement work may be

needed to meet short-term VQO's. Visual diversity along active travelways (such as canopy layering, flowering trees) is protected from treatments where feasible and needed to meet VQO's. Tool selection and coordination requirements are determined by a site-specific analysis at the project level.*

The visual quality objectives for the National Forests in Mississippi are listed in the following table "Visual Quality Objectives." Under this plan, approximately 1% of the Forest is classified as "preservation;" 7% is classified as retention or partial retention, and 92% is "modification" or "maximum modification."

Detailed maps of these allocations are located in the Forest Supervisor's office in Jackson, MS.

-FSM FOREST PLAN 8/91 AMEND 6-

VISUAL QUALITY OBJECTIVES

	P <u>1</u> /	R <u>2</u> /	PR <u>3</u> /	M <u>4</u> /	MM <u>5</u> /	Deferred <u>6</u> /	TOTAL
Acres	14,823	13,21	568,413	160,770	882,527	467	1,140,215
%	1	1	6	14	78	0	100

VARIETY CLASSES

	Class A <u>7</u> /	Class B <u>8</u> /	Class C <u>9</u>	Deferred	TOTALS
ACRES	0	407,888	731,860	467	1,140,215
%	0	38	64	--	100

1/ "P" means preservation - ecological changes only.

2/ "R" means retention - management practices are not evident to the casual observer.

3/ "PR" means partial retention - management practices are visually subordinate in the landscape.

4/ "M" means modification - management practices may dominate the landscape.

5/ "MM" means maximum modification - management practices may visually dominate the landscape.

6/ Developed recreation sites proper.

7/ Class A - most variety.

8/ Class B - common.

9/ Class C - least variety.

The National Forests in Mississippi will apply the concept of "desired character" to those areas inventoried as Retention (R) and Partial Retention (PR). This concept maintains desirable existing character over time; changes existing landscape character to permit other resource management activities; or promotes visual enhancement. The two principal situations where the desired character concept will apply are for large, panoramic views of

homogeneous, unbroken forest canopy, and/or along visually sensitive corridor viewsheds, such as roads, trails, or streams.

Opportunities and constraints regarding desired character must be responsive to distance zones with particular emphasis in foreground zones. Along trails, where slow travel permits more intensive observation, apparent size and scale of the management activity and the amount of logging residue are particularly significant and may require substantial change in normal timber management practices.

CULTURAL RESOURCE MANAGEMENT

During Fiscal Year 1983 a cultural resource overview was finished which documents the general prehistory, history, and geography of the state; forest management practices and their potential impacts to cultural resources; known cultural resources and investigations on the Forest; and directions for future work. As pointed out in the overview, Mississippi had a dense indigenous population prior to American settlement, which persisted up until the mid-1830's following a series of removals to western lands. Indian settlements ranging from large, permanently occupied villages to small, briefly occupied campsites occur all over the state. The larger, more spectacular sites, generally are found in large, mature river valleys and consequently more attention has been directed there. The smaller, less visible campsites can be found anywhere, but commonly occur in the forested uplands which also coincide with much of the National Forest lands in the state. Thus, a study of the cultural resources on the Forest can contribute to the growing body of knowledge concerning the range of prehistoric Indian occupations in the state. In addition, the scattered remains of historic-era homesites or farmsteads occur on the Forest, the study of which can help round out an understanding of the settlement of the state, and accompanying history.

The goals of the Forest's Cultural Resource Management program are four-fold:
Inventory is a continued process of surveying forest

lands in advance of the activities of other resource programs, as well as inventories conducted independent of a specific use proposal. To date, approximately 7% of the Forest has been inventoried. Evaluation is determining the significance of inventoried cultural resource properties primarily in relation to criteria established by the National Register of Historic Places. Sites evaluated as being "insignificant" will not be managed under the Forest's cultural resource program. To date, about 250 cultural resource sites have been identified, with the majority determined insignificant. One property, the Owl Creek Mounds, is listed on the National Register. There are three other sites determined potentially significant: the Dowling Bayou Complex and Riley site on the Delta National Forest, and site Wi-509 on the Ackerman Unit of the Tombigbee National Forest.

Cultural resource Protection involves designing and implementing procedures to protect significant cultural sites from damage or destruction. This involves maintaining the confidentiality of their locations, except where they are used for interpretation, signing or area closure, fencing, and screening with buffers or surface cover. Also involved is periodic site visits to check the field condition of the significant property. Where damage to significant properties is unavoidable through either uncontrollable vandalism or natural forces it will be mitigated through salvage. Enhancement involves encouraging the use of cultural resource properties for research and academic purposes by providing information to the State Historic Preservation Officer, who in turn can use such information in developing statewide historic preservation plans. It also involves publishing and disseminating information on the Forest's cultural resource management program to interested and concerned individuals or groups such as the Mississippi Archaeological Society, Mississippi Academy of Sciences, and university libraries. Enhancement presupposes a measure of interpretation of suitable properties for the enjoyment and awareness of the forest user. Emphasis is low cost and maintenance types of developments such as interpretive signing, hand-out literature or self-guided trails. Currently, interpretive posters are posted at Turkey Fork Lake, the Black Creek Trail, and the Tuxachanie Trail, all on the De Soto National Forest. Interpretive opportunities to explore include the Robinson Road on the Tombigbee National Forest; the Old Federal Road, and the POW Camp on the De Soto National Forest; Shongelo and Marathon on the Bienville National Forest; and the Rodriguez homesite on the Homochitto National Forest. No doubt other other opportunities will arise as the cultural resource program develops.

RANGE

Public demand for grazing on the National Forest in Mississippi has been on the decline since 1976. In 1975, at the peak of the grazing program, there were over 38,000 permitted AUM's. Now, there are less than 12,000 AUM's permitted on the De Soto National Forest. Despite low demand, forage quantity, quality, and availability continues to improve. However, utilizing this

inventory of forage under the plan will continue to be a concern. Working toward resolving this concern the Forest will initiate an information and education program designed to increase state and local beef producers' awareness of the grazing opportunities available on the National Forest. Placing more emphasis on utilizing the forage resource on national forests should provide stability for existing permittees and encourage other individuals to enter the program.

The reduction in permitted livestock numbers has left numerous grazing allotments vacant. The deteriorating condition of some structural improvements due to the age and lack of maintenance may create problems if demand increases during the planning horizon.

Provision will be made to place permittees in allotments where repair of structural improvement is possible. Once these "suitable" vacant allotments are restocked, priority will shift to reconstruction and new construction of structural improvements. A cost effective analysis (see FSH 2209.11 Range Project Effectiveness Analysis Procedures Handbook) will be performed prior to financing project work.

WILDLIFE

THREATENED AND ENDANGERED SPECIES

The Wildlife Habitat Management Handbook (FSH 2609.23) and Chapter 4 Standards and Guidelines will be used as the guide for management of the habitat for all threatened and endangered species. Of special concern are the following species:

Red-Cockaded Woodpecker

Management requirements for the recovery of this species were implemented within compartment that were designated to provide habitat to provide the set population objective. The requirements are: (1) Colony sites and replacement/recruitment stands were removed from the suitable forest base; (2) Rotation ages for pine species were extended to provide adequate foraging areas of larger DBH pine trees. Forest-wide standards and guidelines give specific management requirements for the red-cockaded woodpecker.

To maintain viable populations of vertebrates, forest planning must (1) maintain numbers of each population above threshold levels, below which population resilience and fitness are lost, and (2) provide kinds, amounts, and distributions of habitats that can support the populations above those threshold levels.

Knowles (1983) has documented the current situation on the De Soto National Forest for the red-cockaded woodpecker (Picoides borealis). From a practical standpoint the distributions of birds on the De Soto represent insular populations. The immediate problems center upon retention of population levels in order to maintain population resilience. Characteristics of the species (e.g., low recruitment rates), specialized habitat, interspecific

competition, and low dispersal potential present immediate problems for these isolated populations.

The theoretical levels to maintain short-term viability seems to be above 30-50 breeding units (Cruze, 1983, M. Lennartz, Pers. Comm.). The number of active colonies on each District is below fifteen. Further isolation of the groups into smaller subgroups through habitat modification poses even higher threats to population resilience.

Mississippi Sandhill Crane

There have been sightings of this bird on the Biloxi Management Area, but no nests have been found. Annual nest surveys will be carried out in suitable habitat. There have been two sites selected to be maintained in an open condition. If nests are found, additional treatment of the surrounding 150-200 acres will be required for foraging. Suitable nesting habitat occurs on cleared lands which are unsuitable for timber production. The management action plan is currently in draft. This will be reviewed by U. S. Fish and Wildlife Service prior to submission to the Regional Forester for approval.

American Alligator

Minimum management requirements for this species are: (1) maintain existing aquatic habitat where the alligator now occurs on Forest lands; (2) prevent poaching and harrassment of the species when possible; (3) protect nests, eggs, and hatchlings; (4) where individuals might impact recreational activities in lakes they will be relocated to similar habitat.

Eastern Indigo Snake

The eastern indigo snake, present on Forest Service lands in Mississippi only as an introduced species (last natural sighting in Mississippi - Cooke, 1954), requires specific management practices. The snake favors sand-ridge habitat types (longleaf pine, turkey oak, and wire grass) and is intimately associated with the gopher tortoise. Both species share the same burrow during winter; the snakes also nest, forage around, and den in tortoise burrows during other seasons.

Minimum management practices for the eastern indigo snake on Forest Service land in Mississippi are: (1) protect gopher tortoise burrow sites from degradation; (2) discourage collectors from taking snakes for sale; (3) maintain current burning practices for the sand hill areas; (4) when harvesting timber in sandhill areas, regenerate to longleaf pine when possible; (5) reestablish indigo snake populations where reasonable, and (6) improve the attitude of the public and their behavior towards indigo snakes.

SPECIAL CONCERN -

Those Under Consideration for
Threatened and Endangered Status

Vertebrate Species

Gopher Tortoise

The gopher tortoise on Forest Service lands in Mississippi currently is not a federally listed species. However, viable populations across its entire geographical range continue to decline to very low levels. Factors for the decline are: (1) low egg survival to sub-adult status; (2) long time period to sexual maturity; (3) susceptibility to predation throughout entire life; (4) specific habitat requirements; and (5) lack of public awareness in conservation.

To maintain viable populations of the gopher tortoise the following should be implemented: (1) protect burrow sites from degradation; (2) burn the longleaf pine - wire grass sand ridges to foster tender grasses; (3) prevent human predations through a Forest closure order and cooperation with the Mississippi Heritage Program, Department of Wildlife Conservation; (4) collect status survey data through Forest crews; and (5) encourage conservation of the species throughout the De Soto National Forest.

Plant Species

1. Rhapidophyllum hystrix (Pursh) H. Wendl & Drude

Areaceae

COMMON NAMES: Needle Palm, Blue Palmetto, Vegetable-Porcupine, Dwarf Saw Palmetto, Spine Palm.

Scientific Synonymy: Chamaerops hystrix Pursh; Sabal hystrix (Pursh) Nuttall

HABITAT: Low, moist to wet sites with rich humus, calcareous clay or sandy soils in woods, swamps, and hammocks. Within the state it is known to occur either along the floodplains or small streams or along the drainages of rich, wooded ravines, usually associated with limestone or calcareous outcroppings.

DISTRIBUTION: Miss. - North Central Palteau - Lauderdale Co.; Jackson Prairie Belt - Clarke, Wayne, Smith Counties; Longleaf Pine Belt - Simpson, Forrest, George, & Jackson Counties.

LIMITING FACTORS: Collecting for sale in the nursery and horticultural field is a serious problem for the Needle Palm. This coupled with irregular flowering, poor fruit set, and high seed parasitism threatens the continued existence of this species in the wild. Reproduction is primarily by vegetative means which results only in maintenance rather than expansion

of existing populations. Rhapidophyllum is not vigorous or aggressive and it is doubtful whether it can successfully compete with sun-loving (heliophilic) plants. It does occupy habitats successfully with low light intensity but when released by opening the canopy the growth becomes more vigorous.

MANAGEMENT FACTORS: 1. Protect from overcollecting by anyone. 2. Careful monitoring of the population. 3. Maintain a stable refuge for this species by preserving representative habitats.

2. Rhynchospora macra (C. B. Clarke) Small

Cyperaceae

COMMON NAME: Sp. of Beak-Rushes

Scientific Synonymy: Rhynchospora alba macra Clarke

HABITAT: Bogs, wet pine savannas and flatwoods.

DISTRIBUTION: Miss. - Longleaf Pine Belt and Coastal Pine Meadows; George, Hancock, Harrison, and Greene Counties.

LIMITING FACTORS: This is a species of the savannah-bog community which thrives in full sun or partial shade and loses vigor as shade increases with the encroachment of woody species.

MANAGEMENT FACTORS: Rhynchospora macra associated with the grass-sedge complex of wet, peaty bogs. Maintenance of this species is dependent on periodic burning which reduces woody competition. Any mechanical site preparation which involves drainage or disruption of the bog soil should be avoided.

3. Planteria integra (Nutt.) Spreng.

Orchidaceae

COMMON NAME: Yellow Fringeless Orchid, Southern Yellow-Orchid

Scientific Synonymy: Habenaria integra (Nutt.) Spreng;
Gymnadeniopsis integra (Nutt.) Ryd.

HABITAT: Pine flatwoods, savannas, swamps, and open acid bogs.

DISTRIBUTION: Miss. - Longleaf Pine Belt and Coastal Pine Meadows Pearl River, Harrison, George, Jackson, and Greene Counties.

LIMITING FACTORS: Threatened by the encroachment of a woody and/or herbaceous cover concurrent with plant succession in

the absence of fire. Any site preparation involving drainage would eliminate the species.

MANAGEMENT FACTORS: Periodic burning is necessary to maintain a suitable habitat for this seral species of the acid pinelands.

4. Petalostemum gracilis Nutt.

Fabaceae

COMMON NAME: Sp. of Prairie-Clover

Scientific Synonymy: Dalea gracilis Nutt.

HABITAT: Sandy Pinelands.

DISTRIBUTION: Miss. - Coastal Pine Meadows & Longleaf Pine Belt: Perry, Harrison, Jackson, Stone, and George Counties.

LIMITING FACTORS: This species is threatened by the development of a woody cover concurrent with plant succession in the absence of fire.

MANAGEMENT FACTORS; Although Petalostemum gracilis is probably not a fire adapted species, controlled burning (except during the growing season) would benefit this species by reducing competitive vegetation, thus maintaining a suitable habitat.

5. Gordonia lasianthus (L.) Ellis

Theaceae

COMMON NAMES: Loblolly bay, Tanbay, Redbay, Black Laurel

Scientific Synonymy: None

HABITAT: Non-alluvial swamps, bays and low woods, often in acid soil.

DISTRIBUTION: Miss. - Longleaf Pine Belt: Stone, Perry, and George Counties.

LIMITING FACTORS: Threatened by the destruction of habitat with the drainage swamps and logging operations.

MANAGEMENT FACTORS: Preserve suitable habitat by avoiding any site preparation methods which would involve drainage and use care in logging operations where populations are known to occur. Loblolly bay sprouts vigorously in openings in bayheads which seems to indicate that it is not totally dependent on a closed canopy for its existence.

6. Ilex amelanchier M. A. Curtis
Aquifoliaceae

COMMON NAMES: Juneberry Holly, Sarvis Holly
Scientific Synonymy: Ilex dubia BSP.

HABITAT: Found on sandy swamps, wooded stream and river banks, and low floodplains.

DISTRIBUTION: Miss. - Longleaf Pine Belt: Pearl River, Forrest, Jackson, and George Counties.

LIMITING FACTORS: Threatened by drainage of swamps, logging operations, and stream channelization.

MANAGEMENT FACTORS: Preserve suitable habitat by not draining swamps. Use care in logging areas with known populations.

7. Nymphoides cordata (Ell.) Fern.
Gentianaceae

COMMON NAME: Little Floating-Heart
Scientific Synonymy: None

HABITAT: Found in fresh water; in pools, swamps and ponds.

DISTRIBUTION: Miss. - Longleaf Pine Belt: Forrest County.

LIMITING FACTORS: Threatened by the drainage of swamps and ponds which would eliminate this species.

MANAGEMENT FACTORS: Preserve representative habitat by avoiding any site preparation method which would lower the water table.

SENSITIVE INVERTEBRATES AND VERTEBRATES

All invertebrates and vertebrate species listed by the Mississippi Department of Wildlife Conservation as threatened and endangered are considered "sensitive species" in this Plan. All management activities concerning these species and their habitat will be coordinated with either the Mississippi Natural Heritage Program or the Department of Wildlife Conservation. When populations of the species occur on forest lands, management practices will include advisement by the above mentioned agencies.

Sensitive Invertebrates and Vertebrates include:

crayfish - Procambarus spp.
Southern hog-nose snake - Heterodon simus

blackpine snake - Pituophis melanoleucus lodingi
rainbow snake - Forancia erythrogramma

Additional species on the state's threatened and endangered list can be found in Appendix I.

Sensitive Plants

Sensitive plants are protected and managed under guidelines found either in the current Wildlife Habitat Management Handbook (FSH 2609.23) and Chapter 4 Standards and Guidelines, or are in the process of being developed. All plant species listed by the Mississippi Department of Wildlife Conservation as threatened and endangered are considered in this category. All management activities concerning these species and their habitat will be coordinated with the Mississippi Natural Heritage Program, Department of Wildlife Conservation. Sensitive plants include those found in Appendix I.

VIABLE POPULATIONS

To maintain viable populations of all native vertebrate and plant species, specific management practices, standards and guidelines are required. In addition to practices shown in "Threatened and Endangered Species," management area plans, and the standards and guidelines found in this Plan, the following will apply:

1. New and existing TSL-D system roads will be classified as long-term facilities, but will be generally managed for intermittent use. While open, the roads will generally be maintained to a level appropriate with use, and when closed will be placed in maintenance level one. Roads treated like this may be managed as linear wildlife openings.

Approximately 66% of local roads will be closed to public use. This road closure will minimize disturbance and/or damage to populations of wild turkey and riparian-associated species. These closed roads will be seeded with grass mixtures beneficial to wildlife species.

Over 600,000 acres will remain within the Mississippi Department of Wildlife Conservation Management Area program. All management activities will be coordinated with this agency.

Lands unsuitable for timber management will contribute to overall forest diversity by providing permanent openings, water areas, permanent "edge," and areas of unmanaged forest of varying densities.

2. Where needed, existing openings, key areas, inclusions, riparian areas, and transition zones will be maintained and managed to benefit wildlife.

3. Minimum requirements for large diameter dependent species will be met by developing at least 2.5% of the commercial forest area in large size class communities.

DIVERSITY

Standards and guidelines incorporated into all management prescriptions in this Plan prevent the practice of forest-wide species monoculture. Diversity of plants and animals in all stands is needed to maintain viable populations of many species. All stands in the Forest will have components of species other than the designated management type present.

DISPOSITION OF MIXED FOREST TYPES ACRES

	PH Modeled as <u>Pine</u>	PH Modeled as <u>Hwd</u>	HP Modeled as <u>Pine</u>	HP Modeled as <u>Hwd</u>
Bienville	1620	488	392	791
Biloxi	1938	903	796	526
Black Creek	1754	1486	1473	8,821
Bude	0	0	0	0
Chickasawhay	196	2570	565	11,798
Delta	0	0	0	0
Holly Springs	985	54	5380	1,793
Homochitto	0	0	0	0
Strong River	2859	416	183	4,908
Tombigbee	1952	195	961	1,747

The acreage of mixed forest types shown above were modeled as pine or hardwood management types.

MANAGEMENT INDICATOR SPECIES

Habitats will be managed to maintain viable populations of all existing native vertebrate species. Management indicator species (MIS) have been selected as representative species of ecosystem communities and their associated species. The MIS selected ensure that if the habitat requirements are met for them, then habitat will be available for all existing native vertebrate species.

This plan provides for minimum viable populations of all MIS and their associates. Species indigenous to early forest seral stages, such as white-tailed deer, will prosper. Habitat capability for mid- and late-seral forest associates will be provided for within minimum management requirements. Some of these species may result in fewer numbers than currently exist.

MIS were selected to represent habitat conditions throughout the terrestrial and aquatic environments of the National Forests in Mississippi. The following discussion gives the selected management indicator species for the following environments:

Terrestrial Habitats

- Grass/Forb - Seedling/Sapling (0-10 years)
- Sawtimber/Over Mature Sawtimber (40+ years)
- Grass/Forb/Shrub Bog (Savanna)
- Delta Wetlands, Sloughs, and Lakes

Aquatic Habitats

- Northern Streams
- Southwest Streams
- Southeast Streams
- Lakes and Ponds

Terrestrial Habitats

Grass/Forb - Seedling/Sapling (0-10 years):

Forest-Wide - White-tailed deer was selected as an early age indicator of all forested habitat types. Although the species is highly adaptable to varying environmental conditions and found in all forest age classes, it is primarily a browser depending on plants found in greatest quantities within early forest stages. Being a large herbivore, the deer requires a large home range representing other early age species with smaller range requirements. It is also a high demand game species of economic importance. Deer hunting accounts for approximately 80% of the hunter-use in Mississippi (Mississippi Department of Wildlife Conservation, 1981, Hunter Harvest Survey.)

Longleaf Pine:

- White-tailed Deer
- Bachman's Sparrow
- Bobwhite Quail

The Bachman's sparrow and bobwhite quail were selected to represent early age (0-10 yrs.) longleaf pine. The Bachman's sparrow (pine woods sparrow) is at home in dry open stretches of pines with grass and scattered shrubs. This makes it a good indicator of early succession habitat conditions expressed during regeneration. Quail are primarily seed eaters associated with habitat conditions of interspersed woodland, open land, and cultivated lands. Again, regeneration of longleaf pine and its interspersed will directly affect the welfare of the species and capability as a game animal.

Slash Pine:

- White-tailed Deer

Previously discussed under forest-wide.

Yellow Pine (Loblolly and Shortleaf):

White-tailed Deer
Bobwhite Quail
Eastern Meadowlark

For the early age yellow pine type eastern meadowlark and bobwhite quail were selected. Primarily a species of open farmlands the eastern meadowlark is found in cleared grassy areas such as created during forest regeneration. Population numbers will reflect regeneration acres, representing other species of this habitat type.

Moderate Yield Slash (60-70 Site Index)

White-tailed Deer
Bachman's Sparrow

Species discussed under previous habitat types.

Pine-Hardwood (Homochitto National Forest)

White-tailed Deer
American Kestrel (Sparrow Hawk)

The American kestrel was selected as a representative of the early age mixed pine/hardwood type. Although analysis showed that there were no species restricted to this habitat type, the kestrel will represent perching and nesting needs. Adequate snags and cavity trees must be present for suitable conditions within this richly diverse forest community.

Hardwood (Upland and Bottomland)

White-tailed Deer
Rufous-sided Towhee

To represent the shrub and brushy conditions found in the mid to later stages of this habitat type (4-10 yrs.), the rufous-sided towhee was selected. Feeding and nesting in and around heavy undergrowth is characteristic of the species and will indicate conditions for other species of this type such as the yellow-breasted chat.

Sawtimber/Over-Mature Sawtimber (40+ Yrs.) Late Seral Stage

Forest-wide
(except: Moderate Yield Slash Pine)

Eastern Wild Turkey
Pileated Woodpecker

The eastern wild turkey and the pileated woodpecker were selected as late succession forest-wide indicators. Selection of the eastern wild turkey was based on its relatively large home range and its affinity for mature and over-mature forest conditions with a diverse mix of hardwoods. Meeting food and cover requirements will support a wide array of mature forest vertebrates. Pileated woodpecker was selected to represent the primary excavators and secondary cavity users dependent on mature forest conditions. The large home range of the species relates well to the concept of MIS.

Longleaf Pine

Eastern Wild Turkey
Pileated Woodpecker
Red-cockaded Woodpecker (endangered)
Gopher Tortoise (sensitive)
Fox Squirrel

As an old growth indicator the red-cockaded woodpecker is dependent on large diseased living pines for cavity excavation. It fills a key role in providing cavities for other piney woods cavity users and reflects an open stand conditions with reduced mid-story component. Selection of the gopher tortoise was made to represent the upland mature pine character with a dominating grassy ground cover. This burrowing species commensally interacts with various other burrow dwellers such as the eastern indigo snake and diamondbacked rattlesnake. The eastern fox squirrel was selected as an indicator of sufficient mast bearing oaks and hickories, representing hard mast consumer of this habitat type.

Slash Pine

Eastern Wild Turkey
Pileated Woodpecker
Gopher Tortoise (sensitive)

Species selection as discussed under previous habitat types.

Yellow Pine (Loblolly and Shortleaf)

Eastern Wild Turkey
Pileated Woodpecker
Red-cockaded Woodpecker (endangered)
Pine Warbler

A true resident of the pine forest, the pine warbler nests exclusively in pine trees and spends most of its life in the forest. It is a foliage gleaning species

primarily within the forest canopy and was selected to represent this group of vertebrates.

Moderate Yield Slash Pine (60-70 site index)

Downy Woodpecker

The downy woodpecker is a probing insectivore feeding primarily on the trunk and twigs of trees. It was selected to represent cavity users, requiring dead snags of sufficient size and condition to excavate cavities.

Pine-Hardwood (Homochitto National Forest)

Eastern Gray Squirrel
Pileated Woodpecker
Screech Owl

Rich in plant diversity and soil fertility this habitat type is highly productive for the eastern gray squirrel. Because of the dependency on cavities for denning and mast requirements the eastern gray squirrel will indicate habitat conditions for a broad group of forest vertebrates.

Mixed forest habitat is preferred by the screech owl, where it nests mainly in old woodpecker holes and natural cavities. It feeds on rodents and small vertebrates as well as invertebrates. Selection was made to indicate available nesting cavities and suitable populations of small mammal prey species.

Hardwood (Upland and Bottomland)

Eastern Wild Turkey
Pileated Woodpecker
Eastern Gray Squirrel and Delta Fox Squirrel
Hooded Warbler

The hooded warbler was selected as an indicator of the understory shrub component. Feeding and nesting in this layer the hooded warbler reflects the richness, quality, and suitability for other midstory species.

Grass/Forb/Shrub Bog (Savanna)

These wet lower coastal plant flats are characterized by a low soil pH and the presence of an organic hardpan. Plant growth is restricted due to the impenetrable nature of the hardpan and prevailing high water table during the rainy spring and early summer months. Site index for

slash pine is 50 or less. During periods of little precipitation, high evapotranspiration and restricted upward capillary movement of ground water dramatically reduces fuel moisture, increasing the probability of burning. In terms of natural succession, this is a fire climax community. Fire is the dominant controlling agent in maintaining the open character with prevailing grass-forb ground cover.

The plant genus Sarracenia (pitcherplants) was selected to represent this community. Pitcherplants are characteristic of the flora indigenous to these wet sites with S. alata (Buttercup) and S. psittacina (Parrots Pitcherplant) being the species most commonly observed.

Delta Wetlands/Sloughs, and Lakes

These areas are comprised of open water, bald cypress, common buttonbush, water elm, swamp privet, duckweed, and other aquatic vegetation. Because of the water table, very little timber harvesting has occurred adjacent to these areas, and many of the older trees have cavities suitable for nesting.

The wood duck (Aix sponsa) was selected to represent these important communities.

Aquatic Habitats

Many species of fish occur in the streams, lakes, and ponds on the Forest. These habitat types are most likely to be affected by management activities. It is from these groups that our management indicator species were selected.

Lake/Pond - No species are more characteristic of the lake/pond habitat than the Largemouth Bass (Micropterus salmoides) and the Bluegill (Lepomis macrochirus). They are important gamefish, are fairly sensitive to changes in water quality, and have a well-established methodology for monitoring.

Streams - In discussion of the selection method for management indicator species for stream habitats, the non-parasitic lampreys, certain cyprinids, madtoms, and darters as a group, are excellent indicators of aquatic habitat quality and, thus, excellent candidates for management indicator species. The southern brook lamprey (Ichthyomyzon gagei) require clean sand or gravels over which to spawn and are vulnerable to siltation (Boschung and Mettee, 1974). Some of the shiners and most of the madtoms and darters are characteristic of clear, high quality streams and are rarely found in degraded habitats. To these groups were added the shadow bass (Ambloplites aridmmus) and spotted bass (Micropterus punctulatus) because they are important gamefish, as well as being acceptable ecological indicators.

From these groups representative species were chosen for each of the major watersheds on the National Forests in Mississippi. We attempted to select individual species that were good indicator species and existing in sufficient numbers over a sufficient portion of the watershed to make monitoring possible. At this point, it is important to note that the distribution of fish on the National Forest in Mississippi was not determined solely upon the work done by Douglas (1974) and Ebert (in press). In order for a particular species to be selected as a management indicator for a particular watershed, it must have been confirmed from that drainage by these ichthyologists. It is suspected that some species, such as the spotted bass (M. punctulatus) will be found to occur in watershed from which they were not reported by these investigators. Species may be added to certain watershed in the future as monitoring confirms their presence.

The management indicator species for aquatic habitats are summarized by major watershed as follows:

Aquatic System Breakdown

1. Northern Streams, North of I-20 (Jackson North)
2. Southwest Streams, South of I-20 and West of Hwy. 49
3. Southeast Streams, South of I-20 and East of Hwy. 49
4. Lakes and ponds, state-wide

Northern Streams

Northern streams occurring on Forest Service land are characteristically small, often turbid, warm varying flow, and low in pH and conductivity. The northern area is extensively channelized, thus gamefish and lake species can freely move between watersheds. Streams are poorly to moderately shaded with hard clay bottoms, occasionally with silty soft substrate.

Indicator species are:

largemouth bass	<u>Micropterus salmoides</u>
spotted bass	<u>Micropterus punctulatus</u>
bluegill	<u>Lepomis macrochirus</u>
longear sunfish	<u>Lepomis megalotis</u>
southern brook lamprey	<u>Ichthyomyzon gagei</u>
bluntnose shiner	<u>Notropis camurus</u>
striped shiner	<u>Notropis chrysocephalus</u>
freckled madtom	<u>Noturus nocturnus</u>
blackbanded darter	<u>Percinia nigrofaciata</u>
banded darter	<u>Etheostoma zonale</u>

These particular species represent all trophic levels of the stream systems on National Forest land. As indicator species they require good water quality. Game species consist of largemouth bass (M. salmoides), spotted bass (M. punctulatus), bluegill (L. macrochirus), and longear sunfish (L. megalotis).

Substantial populations of these species occur in all streams over 2nd order in size. Lamprey, darters, and madtoms are seldom found in polluted waters. Primary forage species are shiners.

Southwest Streams

Southwest stream management systems on National Forest land are characteristically show flowing, clear, warm, sand-gravel bottom, 1st - 3rd order streams. Low conductivity and acid pH are also characteristic. These streams are moderately shaded, wide and shallow.

Indicator species are:

spotted bass	<u>Micropterus punctulatus</u>
banded darter	<u>Etheostoma zonale</u>
southern brook darter	<u>Ichthyomyzon gagei</u>
rainbow darter	<u>Etheostoma caeruleum</u>
brindled madtom	<u>Noturus miurus</u>
longnose shiner	<u>Notropis longirostris</u>
bluntnose shiner	<u>Notropis camurus</u>
blacktail rehorse	<u>Moulostoma poecilurum</u>

These species are selected because they uniquely inhabit these stream types. The majority are only associated with this specific stream type and these conditions. These species represent an assemblage of fish from all tropic levels. Lamprey, darters, and madtoms (these species) require very good water quality and low turbidity. Spotted bass (M. punctulatus) are the major carnivores in the system and with longear sunfish comprise the game species. Blacktail redhorse (M. poecilurum), longnose shiner (N. longirostris), and bluntnose shiner (N. camurus) represent forage members in the system.

Southeastern Streams

Southeastern streams occurring on Forest Service land are small to moderate in size and flow. They are warm, tannic acid colored, deep with steep banks, sandy to shale massed bottoms, and very low in conductivity with acidic pH. These streams have numerous logjams, hold water in deep holes, and flow slowly.

Indicator species are:

spotted bass	<u>Micropterus punctulatus</u>
longear sunfish	<u>Lepomis megalotis</u>
shadow bass	<u>Ambloplites ariommus</u>
gulf darter	<u>Etheostoma swanii</u>
blackbanded darter	<u>Percina signipinnis</u>
cherryfin shiner	<u>Notropis roseipinnis</u>
weed shiner	<u>Notropis texanus</u>
speckled madtom	<u>Noturus leptacianthus</u>

These species represent the trophic levels available in the stream systems on National Forest land. These fish require good water quality and are generally associated with aquatic vegetation. Game species consist of spotted bass (M. punctulatus), longear sunfish (L. megalotis), and shadow bass (A. ariommus) - some largemouth bass are observed. Prey species are typically shiners while darters and madtoms dwell on the bottom. A unique association between flagfin (N. signipinnis) - cherryfin (N. roseipinnis) shiners exists in these waters.

Lakes and Ponds

Lakes and ponds are typical on the National Forests. Many are located in the northern area of the state. They are PL 566 lakes - shallow, turbid, warm, varying flow. Several lakes in the southwest are spring-fed while numerous ponds and PL 566 lakes are located in the southeast.

Indicator species are:

largemouth bass	<u>Micropterus salmoides</u>
bluegill	<u>Lepomis macrochirus</u>
reardear sunfish	<u>Lepomis microlophus</u>
black crappie	<u>Pomoxis nigro maculatus</u>
white crappie	<u>Pomoxis annularis</u>
channel catfish	<u>Ictalurus punctulatus</u>
golden shiner	<u>Notemigonus chrysoleucus</u>
lake clubsucker	<u>Erimyzow succetta</u>

These species represent the characteristic predator - prey structure in any typical lake or pond. Water quality on National Forest land is usually good. Lakes and ponds vary from one to another, so no real trend can be formulated.

FISHERIES

SENSITIVE SPECIES

Yazoo Darter (Etheostoma sp.) - Management requirements to maintain viable populations on the Holly Springs National Forest include: (1) preventing channelization and stream habitat degradation in the Little Tallahatchie River drainage basin; (2) maintaining riparian buffer zones; and (3) identifying and protecting existing population sites from fish collecting. Life history and further data on the Yazoo darter is referenced in Thompson (1985).

Bluenose Minnow (Notropis welaka) - Management requirements to maintain viable populations on the De Soto National Forest include: (1) restricting its collection by tropical fish merchants; (2) maintaining existing stream habitat; and (3) preventing excessive amounts of watershed runoff propagated through clearcutting timber.

Least Madtom (*Noturus hildebrandi*) - Management requirements to maintain viable populations on the Homochitto National Forest include: (1) controlling sediment loads entering streams of the Homochitto River system; (2) maintaining stream canopy cover through riparian zone buffer strips along streams; (3) restricting the mining of stream gravel on Forest Service areas; and (4) regulating oil well influx of salts in streams where populations occur to under 250 umhos/cm calcium and sodium conductivity.

THREATENED AND ENDANGERED SPECIES

This plan manages and protects all threatened, endangered, and sensitive fish species through standards and guidelines detailed in the Wildlife Handbook, Chapter 2609. Currently, no fish species occurring on Forest Service lands are listed as threatened or endangered; however, the above mentioned sensitive species are currently under consideration and are thus included.

VIABLE POPULATIONS

To maintain viable populations of all native fish species, specific management practices standards and guidelines are required. In addition to the above mentioned practices outlined in the "Sensitive" management plans, and Wildlife Management plans, and the Wildlife standards and guidelines found in this plan, the following fisheries standards and guidelines will apply:

1. Streams

All stream systems on Forest Service lands will be managed for native fish populations. Management practices will follow those outlined in current American Fisheries Society professional publications: "Fisheries Management" (1980) and "Fisheries Techniques" (1983). Sport fish populations will be management for optimal recreation benefit. When possible, cover structures (logs, undercut banks, trees, and pools) will be maintained or constructed to provide at least 100 linear feet per 1000-foot section of stream.

Canopy or cover of streams will be maintained or increased when possible and riparian areas preserved.

Fish populations in streams will not fall below minimum viable levels (presence of indicator species at population levels capable of natural reproduction of the species in a stream). If threatened, supplemental stocking or harvest restrictions may be imposed. Minimum viable or reproducing populations are based on 0.25 mile of stream.

Stream flow conditions will follow those set forward in the soil and water portion. Present water quality parameters for streams will be maintained (2630 fisheries files).

2. Lakes and Ponds

All lakes and ponds on the National Forests in Mississippi will be managed for native fish populations. Exotic fish introductions will occur only with prior agreement and cooperation of the Mississippi Department of Wildlife Conservation. Management practices will follow those set forth by the American Fisheries Society in current techniques manuals (Fisheries Management and Fisheries Techniques). Sport fish populations in lakes and ponds will be managed for optimal recreational benefit. Swingle's 1950 lake balance ratios (F/C, Y/C and A+) in addition to PSD values (Anderson, 1978) will be used to evaluate fish population balance.

When possible structures will be added to increase spawning success and concentrate sport fish for angling. Fertilizing and weed control will be conducted where applicable.

All catch limits and size restrictions on fishing in lakes and ponds on Forest Service land will follow state regulations. Any deviations must meet with Mississippi Department of Wildlife Conservation approval prior to implementation.

Supplemental stocking of sport species will be conducted when population levels fall below national levels (Swingle, 1956 and Anderson, 1978). Fish will be stocked at prescribed rates recommended by the U. S. Fish and Wildlife Service.

3. Addition of pesticides or herbicides into lakes or streams will occur only with prior Forest Service (Regional Office) and Mississippi Department of Wildlife Conservation and Mississippi Department of Natural Resources Bureau of Pollution Control approval. Only EPA aquatic labeled substances will be used.

Diversity

Standards and guidelines incorporated into all Forest management actions in the Plan prevent the practice of Forest-wide species monoculture. Implemented fisheries practices prevent monoculture in Forest lakes and streams. Diversity in all lakes and streams is needed to maintain viable populations of all native fish species. Adequate species diversity will be maintained through stream and lake management practices.

SOIL

The future resource protective trends will be to (1) place more emphasis on the knowledge and conditions of the watersheds through an active watershed inventory documenting funding needs; (2) monitor forest use activities that have a high potential to lower site productivity or lower habitat conditions in ecosystems; (3) improve knowledge of and use of soil and landscape positions in

advising the selection of timber management types for regeneration; (4) maintain schooled and field-experienced personnel having knowledge and ability to carry out specific soil resource protection needs at the Ranger District level; and (5) increase use of harvesting and site preparation methods that reduce excessive soil and watershed damage.

Using the Soil Resource Inventory, soil bodies on landscapes within the 10 land resource areas represented on the National Forest, 80 soil series have been identified. Soil properties affecting management activities relate to erosive sensitivity of exposed surface or subsurface mineral soil particles, seasonal logging periods caused by perched high water tables, and poor water infiltration restricting drainage into the available subsoil reservoir due to reduced soil pore space, as with hardpan or clay subsoils, or compacted surface and subsoil material. Flooding frequency and duration also limits activities. Landslides change the landscape from uniform slopes to highly dissected land, limit logging activities and increase logging costs.

WET SOILS

Soil bodies in drainage classes ranging from somewhat poorly drained through very poorly drained have the greatest effect on management activities. Establishing road/trail networks, recreational facilities and logging seasons are impacted by wet soils. Revegetation and erosion control within watersheds resulting from excess surface runoff are also impacted. Soils in the very poorly drained class are wetlands. They require a greater effort to protect and need increased monitoring. The percentage of the National Forests that are wetlands is small.

CLAYEY SOILS

Soil bodies whose clay matrix is close to or near the surface impact management. They do this by limiting the season of use and predisposing the site and surrounding ecosystem to erosion. These soils have a significant impact and are not always near the surface by geologic format.

Soil bodies with high shrink-swell clays are of particular note. They have reduced water intake (infiltration) when swelled, yet when cracked have rapid intake and potential piping and dislodging. Gullies form in this condition, particularly on steep slopes. Swelling and shrinking lead to distortion of structures associated with the rapid fluctuating changes in volume of these soils. Revegetation of these low fertility clays and increased roading costs needed when using these exposed clays are major problems. Strict logging administration, soil testing, diverting excess runoff from working areas, and avoiding extensive exposure of these clays are required.

SOIL TOXICITY

Many subsoils of soil bodies contain minerals that become increasingly toxic and/or become cemented when exposed. Revegetation efforts become more difficult, and erosion (on-site, and off-site) transported sediments increase over time. Sodium, sulfides, aluminum and alkalinity are the most dominant toxic substances. Soil sampling at the sites for fertilizer and lime recommendations are necessary. Selection of established seeding mixtures emphasizing the erosion control aspects of selected mixtures are found in current guides. Additionally, diverting excess water from the site to nearby areas, and providing mulch to protect the seeded area, and conserving on-site moisture are necessary.

Wet sites and sites that are low in productivity require fertilization to improve soil productivity, thus increasing site suitability for timber production. These wet sites are more susceptible to compaction and soil damage than drier sites. An average of 530 acres per annum of slash pine sites will be fertilized, with some bedding, over the 50-year planning horizon. Most of these sites are on wet soils with low nutrient (phosphorus and nitrogen) availability. The addition of nitrogen and phosphorus following timber harvesting will maintain (and in some cases improve) site productivity for all resources.

WATER

Water yield increases through vegetative manipulation (primarily timber harvesting activities). There are 239,721 acres of wetlands and riparian areas on the National Forests. Major developed waters for recreation make up 1,004 acres. Oil and gas minerals activity have the greatest potential to reduce water quality on the National Forests. Continued water quality monitoring at these sites, and increased monitoring associated with timber harvesting and site preparation will help prevent future potential problems.

The following table gives the water management objectives for the administrative watersheds on the Forest.

WATERSHED CLASSIFICATION/OBJECTIVE USE

Administrative Watersheds in S. Atlantic-Gulf Region	!A!E!F!G! ! ! ! ! ! ! ! ! ! ! ! ! ! ! !	Administrative Watersheds in Lower Mississippi Region	!A!E!F!G! ! ! ! ! ! ! ! ! ! ! ! ! ! ! !
Upper Pearl	!x ! ! ! !	Yazoo Group	! ! ! !x!
Balucta Creek	!x ! ! ! !	Sunflower Group	! ! ! !x!
Shockaloe Creek	!x ! ! ! !	Clark Lake Group	! ! ! !x!
Tallahogue Creek	!x ! ! ! !	Muddy Creek	! !x! ! !
Hontokalo Group	!x ! ! ! !	Wolf River	!x! ! ! !
Bienville Group	!x ! ! ! !	Oaklimeter Creek	! ! !x! !
Strong River-Wt. Oak Group	! ! ! ! ! !x ! ! ! !	Tallahatchie Group	! ! !x! !
Oakohay Creek	!x ! ! ! !	Tippah Group	! ! !x! !
Leaf River	! !x! ! !	Chewalla Creek	! ! !x! !
Ichusa Creek	!x ! ! ! !	Spring Creek	!x! ! ! !
Tallahala	!x ! ! ! !	Cyprus-Puskus Group	! ! !x! !
Saucier Creek	!x ! ! ! !	Yacona Group	!x! ! ! !
Biloxi Group	!x ! ! ! !	Coldwater River	!x! ! ! !
Tuxachanie Creek	!x ! ! ! !	Sheldon Group	!x! ! ! !
Tchoutacabouffa River	! ! ! ! ! !x ! ! ! !	Middleton-Porter-Caston Group	! ! ! ! ! !x! ! ! !
North Group	!x ! ! ! !	McGehee Creek	!x! ! ! !
Black Group	!x ! ! ! !	Homochitto	!x! ! ! !
Beaverdam Creek	!x ! ! ! !	Middle Fork Creek	!x! ! ! !
Poplar Creek	!x ! ! ! !	Eddicton Group	!x! ! ! !
Hickory Creek	!x ! ! ! !	Richardson-Dry Creek	!x! ! ! !
Pierces Creek	!x ! ! ! !	Nebo Group	!x! ! ! !
Cyprus Creek	!x ! ! ! !	Crooked Creek	!x! ! ! !
Whiskey Creek	!x ! ! ! !	Foster-Brushy Creeks	!x! ! ! !
Leaf-Greens Group	!x ! ! ! !	Wells Creek	!x! ! ! !
Camp Group	!x ! ! ! !	Tillatoba Group	! ! !x! !
Tiger Group	!x ! ! ! !	Long Branch Group	!x! ! ! !
Thompson Group	!x ! ! ! !	Yalobusha Group	! ! !x! !
Chickasawhay	!x ! ! ! !		! ! ! ! !
Chuquatonchee Creek	! !x! ! !		! ! ! ! !
Holka Creek	! !x! ! !		! ! ! ! !
Tombigbee	!x ! ! ! !		! ! ! ! !

EXPLANATION OF CLASSIFICATION AND OBJECTIVE USE:

A = Primary Contact Recreation - The raw surface water is suitable for direct contact with the human body. In developed recreation areas it is suitable to the point of complete body submergence. Waters may be used for swimming, boating, and other activities.

E and F = Flood Control Structure. E's were built under Public Law 566; F's were built under Public Law 534. Waters are suitable for fishing activities only.

G = Greentree Reservoirs established to provide habitat for winter waterfowl.

Included in the above watersheds are: Lake Gieger, Marathon Lake, Shongelo Lake, Turkey Fork Lake, Black Creek, Clear Springs Lake, Choctaw Lake, Davis Lake, and Chewalla Lake. These bodies of water will be managed for Primary Contact Recreation suitable for complete body submergence.

LANDS

The lands activity includes a number of items including land acquisition; exchange; transfers or donations; granting land use permits; acquiring and granting rights-of-way; landline location and maintenance; and resolving title claims and occupancy trespass cases.

There are six proclaimed National Forests in Mississippi comprising 1,140,215 acres. The bulk of this land was purchased, but 1,603 acres were reserved from the Public Domain, and 82,381 acres were acquired under authority of the Bankhead-Jones Farm Tenant Act, and were subsequently transferred to the Forest Service. Ownership within the Forest proclamation boundaries is scattered, ranging from 28.1% on the Holly Springs National Forest to 62.9% on the De Soto National Forest.

Protecting forest resources and outputs; maximizing opportunities for forest use; and permitting management efficiency are three goals of forest management. Although purchase of additional land is desirable, budget constraints are expected to preclude much acquisition by this means.

Consolidation through land exchange is one way of promoting management efficiency. By disposing of isolated tracts and acquiring inholdings we can reduce landline and corner maintenance; reduce the potential for encroachment; reduce the number of rights-of-way to be acquired; and reduce the potential for special use permits on Forest land adjacent to private lands. Annually, for the past ten years, we have acquired from 1,500 to 3,800 acres of private land while conveying somewhat fewer acres of federal land through the exchange process.

Community needs are considered in reviewing landownership adjustment proposals, particularly where federal ownership restricts reasonable community growth and expansion. The constricting federal lands would most likely be made available for disposal through the land exchange program.

Lands that are needed for special resource objectives are targeted during landownership adjustment planning and review. Such categories of land receive special emphasis when negotiating land exchanges and purchases. Examples are unique recreational lands; forested, cutover, or denuded lands within the watershed of navigable streams that may be necessary to the regulation of the flow of navigable streams or for the production of timber; tracts needed for protection and improvement of the environment -- soil, water, air, vegetation, fish, wildlife, and natural beauty; tracts

needed to achieve a balance of resource uses from both public and private lands that will best meet present and future national and regional needs.

It is anticipated that land adjustment during the plan period will not significantly alter scheduled activities or resource outputs. Land purchases targeted for the plan period are contingent on adequate annual funds and on the concurrence of county Boards of Supervisors and the Mississippi Forestry Commission as required by Weeks Law enabling legislation.

Guidelines for Land Ownership Adjustment for the National Forests in Mississippi is located in Appendix E.

Land uses are those activities conducted on National Forest land by individuals, corporations, political jurisdictions, etc., and are authorized by special use permit, easement deed, license or memorandum of understanding. There is a wide variety of uses on the National Forests in Mississippi, 60% of which fall into the category of public roads and utilities.

Status of Land Uses as of 10/81

<u>Kind of Use</u>	<u>Total Cases</u>	<u>Acres</u>	<u>Miles</u>
Recreation Uses	4	722	
Agricultural Uses	25	71	
Community Uses	30	89	1
Industrial Uses	58	170	5
Research, Study, & Training Use	11	129,818	
Transportation Uses	307	4,153	359
Utility & Communication Uses	112	4,802	1,458
Water Uses	<u>98</u>	<u>6,939</u>	
	645	146,764	

The largest special use permit is to the Mississippi National Guard for 116,199 acres in Camp Shelby. There are 7,564 additional acres under permit to the military. Over 5,000 acres are under permit to various drainage districts for small watershed dams and reservoirs. Special use permits will be permitted on National Forest lands only after concluding from an analysis that there are no reasonable alternative sites available on private land and the action will not prove detrimental to the public good.

Transportation corridors are essentially in place in Mississippi. New applicants for utility rights-of-way will be required to put their new facilities in existing corridors if at all possible. A site specific assessment on each application will help decide if there is a public need for the new line, what is the preferred alternative route, and can the use reasonably be put in an existing corridor.

Landline location, landline maintenance, title claims, and encroachments are activities needed to identify and protect

National Forest land. There were 4,769 miles of landline on the National Forests in Mississippi at the start of FY 1982. It has all been run to R-8 survey standards. On newly acquired tracts it will be necessary to survey the landlines. Investigation of title claims or encroachments may require resurveys. The Forests are maintaining 600 miles of landline annually, and this degree of maintenance is expected to continue.

There are 387 inventoried claims and encroachments on the National Forest in Mississippi. The majority of these are fences on National Forest land, although in a few cases there are portions of barns or houses on the property line. Normally, 5 to 10 of these are resolved each year. Most are resolved by mutual agreement and movement of the fence to the true property line. Others require court action to protect the public land. In FY 1981, 36 cases were resolved. During landline maintenance activities each year new encroachments are discovered and added to the inventory. These will eventually be resolved.

Because of the scattered pattern of the National Forest ownership, access sometimes presents a problem. Although the primary road system through the Forest is in place, isolated tracts and portions of larger tracts have no permanent access. Region 8 policy requires permanent access to all National Forest land that is to remain in public ownership. Permanent right-of-way easements are acquired for this reason. These easements and the roads that are built across them provide for administration of the National Forests as well as public access for recreational pursuits. The National Forests in Mississippi acquire from 10 to 25 easements annually.

MINERALS

The National Forests in Mississippi are located in the Gulf Coastal Plain. A number of minerals occur, but their economic significance varies greatly. Iron ore, bituminous coal, lignite, limestone, aluminum ore, bentonite, sulfur, oil and gas, and common variety minerals are located on the National Forests. Oil, gas, and common variety minerals are the only minerals being produced from the National Forests. Bentonite is commercially mined from private land within the Bienville National Forest Proclamation Boundary, and it is likely that commercial deposits also exist on the National Forests.

Lignite is found on the Tombigbee and Holly Springs National Forests. Private land adjacent to the Forest has been leased for lignite, but no leases exist on National Forest land.

The state of Mississippi is very interested in developing commercial deposits of lignite for electric power generation or synfuel development. Although interest has been expressed by at least two companies, no commercial projects have materialized.

-Based on the Federal law concerning coal mining east of the 100th meridian and the apparent nature of the lignite beds in Mississippi, the probability of mining lignite on the National Forests in Mississippi appears low. -

Summary of Mineral Activity
Level of Activity

<u>Mineral</u>	<u>Past</u>	<u>Present</u>	<u>Future</u>
Oil & Gas	High	High	High
Bentonite	Low	Low	Low to moderate
Common Variety	Low to moderate	Low to moderate	Low to moderate
Lignite	Low	Low	Low

Practically all of the National Forests in Mississippi are acquired land. Only 1,603 acres are public domain. Between seven and eight percent of the mineral rights are reserved or outstanding in third parties. The balance are owned by the United States.

Mineral Ownership on the
National Forests in Mississippi

<u>National Forest</u>	<u>Acres Reserved</u>	<u>Acres Out- Standing</u>	<u>USA Minerals under Private Surface</u>	<u>USA Minerals & USA Surface</u>
Bienville	1,082	5,592	2,037	171,700
Delta	273	2,518	1,891	56,727
De Soto	3,094	33,370	6,402	464,095
Holly Springs	3,063	6,652	2,862	116,600
Yalobusha	106	80	353	20,236
Homochitto	526	25,117	3,234	163,138
Tombigbee	<u>1,296</u>	<u>2,219</u>	<u>2,289</u>	<u>62,681</u>
TOTAL	9,440	75,548	19,068	1,055,227

Oil and gas are the most valuable mineral resources on the National Forests in Mississippi. Drilling began in 1929 and continues. The De Soto, Homochitto, Delta, and Bienville National Forests lie within the Mississippi Salt Basin. The Tombigbee and part of the Holly Springs National Forests lie within the Black Warrior Basin. An indication of the oil and gas activity can be seen in the following table.

Oil & Gas Leasing & Producing Wells 1/1/82

<u>National Forest</u>	<u># Leases</u>	<u>Acres Under Lease</u>	<u># Producing Wells</u>
Bienville	360	139,406	1
Delta	56	45,647	0
De Soto	830	381,580	18
Holly Springs	44	60,939	0
Homochitto	472	140,483	118
Tombigbee	<u>39</u>	<u>56,071</u>	<u>0</u>
TOTAL	1,801	824,126	138

During FY 1981 the National Forests in Mississippi generated \$2,711,216 in revenue for the government from mineral activities.

In addition, during CY 1981, 318,535 tons of sand, clay, and gravel were given to the State of Mississippi and various counties to be used on roads. Also, 33,504 tons were sold to counties.

During FY 1981 the National Forests in Mississippi processed and administered 138 oil and gas lease applications, 17 drilling permits, 78 geophysical prospecting permits, and 138 producing wells. In addition to the oil and gas activity, as of 1/1/82 there were 45 sand and gravel pits under permit to various counties for use as road surfacing. The number of pits range from one on the Bienville National Forest to 15 on the Homochitto National Forest.

Considering the demand for domestic oil and gas, the current prospecting activity in Mississippi is expected to continue at a moderate to high level. The potential for future oil and gas development is high.

Other resource management activities can have an impact on minerals activities. Normally, however, this impact is small except in the case where surface use precludes any mineral activity. Only 40 acres of public domain land in the National Forests in Mississippi have been withdrawn from mineral entry. This "40" is a part of the Harrison Experimental Forest.

Specially designated areas will impact minerals because unusual measures may be required in order to mitigate the effect of the minerals activity on the area.

Minerals activities can also affect other resource uses. Each oil and gas well will take from three to five acres out of timber production because of site location and access roads. Upon abandonment of the well, however, the area is revegetated. There is also the potential for water pollution due to salt water and oil spills. There have been instances of long-term site quality degradation because of salt water spills. Surface mining creates a significant impact for the duration of the mining.

All oil and gas leasing and development decisions are based upon the programmatic analysis of oil and gas leasing on the National Forests in Mississippi which was written in 1976 and which is referenced elsewhere in this document.

Prior to lease issuance all potential leases are examined by the Forest Service for a variety of legal and environmental problems. Provided they pass these examinations, stipulations of a general nature are added to the leases, and then they are issued by the Bureau of Land Management.

During the development stages of leasing, the Forest Service is consulted prior to any surface disturbing activity. At this time the District Ranger's staff can make any further site specific lease stipulations which are deemed necessary to prevent excess environmental damage. These site specific stipulations are binding on the operator as long as there is just cause for their use.

FACILITIES

MANAGEMENT SITUATION

Transportation - The issues relating to transportation can be summarized as follows: Too many roads; not enough roads; too many roads open; road standards and long-term versus short-term roads. This entire discussion on transportation addresses these issues.

The transportation system for the National Forests in Mississippi consists of 2,400 miles of forest development roads. In addition, there are 793 miles of state and county roads inside the National Forest boundaries that supplement the Forest system. Of the 2,400 miles of forest development roads, 6% are functionally classified as arterials; 14% as collectors, and 80% as locals. The percentage, including state and county roads, is 12% arterial; 27% collector, and 61% local. The state and county roads are all classified as arterials and collectors. The deviation from the national average range is a result of the many miles of arterials and collectors that were necessary to connect small farms and communities that existed prior to acquisition. As many of the small farms are still intermingled with the National Forests, the roads are still important links between other public lands, communities, and market centers. The arterial and collector system provides general access to the entire Forest.

The Forest arterial and collector system is in place and no additional ones are planned. These are gravel surfaced roads that are open for continuous service and are suitable for passenger car travel. The local roads at present are generally open for continuous service and serve as feeders to the arterial and collector system. They are gravel surfaced and generally suitable for passenger car travel; however, some are only suitable for pickup or 4-wheel drive vehicles. The Forest collector and local road system provides opportunities for dispersed motorized recreation.

There are some roads on the system that are substandard for present-day vehicles to travel safely; others are causing unacceptable resource and environmental damage. These roads, or portions of roads, will be reconstructed to correct the problems. Lands suitable for timber production will require some new local roads. These local roads will be constructed as long term facilities and the majority will be managed as intermittent service. In some cases where the facility will not be needed for future land management activities, a short term facility may be used.

The density of roads will depend largely on topography and landownership patterns. At present, the road density of the Forest Service system is 1.35 miles per square mile. When the existing county and state roads are included the density becomes 1.79 miles per square mile. The density of the Forest local road system is 1.08 miles per square mile.

Approximately 800 miles of the 1,931 miles of local roads are in maintenance level 1, thus reducing effective local road density to 0.63 miles per square mile. Road densities were arrived at by dividing the total Forest system (excluding county and state) miles by the total Forest ownership in square miles. The county and state miles that cross National Forest lands were added to the Forest system and divided by the Forest ownership in square miles to arrive at the overall road density for the Forest.

Most of the logging is done with rubber tired skidders, and the general rule is that 1/4 mile is the limit of economical skidding. This would require a density of 2.0 miles per square mile, although some areas may have densities ranging up to 4.0 miles per square mile because of topographic and/or other restrictions. It is anticipated that about 3,030 miles of the final local road system will be in maintenance level 1.

The existing road system is adequate for all other resource uses, and in some areas may be excessive for wildlife. In areas where road density is detrimental to the wildlife resource roads can be reclassified as intermittent use with closure, revegetation and level 1 maintenance assignment.

Maximizing timber production will result in the Forest becoming roaded quicker than alternatives with less emphasis on timber. Over time the total forest mileage should be the same.

RPA targets indicate a range of construction/reconstruction of 158 miles in 1984 to 220 miles in 2030. The projection of current management, as done in the FORPLAN model analysis, indicates a feasible range of construction/reconstruction of 140 miles in 1984 to 200 miles in 2030.

The Surface Transportation Assistance Act of 1978 (STAA) (PL 95-599) amended the definitions of "forest highway" to make it broad enough to cover many Forest roads that heretofore were ineligible for improvement with Forest highway funds. It now

includes all Forest roads which are under the jurisdiction of, and maintained by, a public authority and open to public travel.

The National Forests in Mississippi have reviewed the county and state road system within the boundaries of the National Forest in view of these new guidelines. Of the 793 miles of state and county roads inside the boundaries, 52 roads totaling 356 miles are of significant importance to the Forest Service and have been nominated to be improved with Forest highway funds. The annual apportionment of funds to Mississippi is very limited, thus road improvement under the program will be very long-term.

The National Forests in Mississippi has 115 buildings exclusive of recreation, and 23 fire lookout towers that facilitate the management and protection of approximately 1,140,000 acres of land. These buildings and towers represent an investment of several million dollars. Some of the buildings have outlived their economic and service lives and are no longer serving their intended purpose. Forty-two (42) of the buildings and all twenty-three (23) towers are in the 25-50 year age class, and seventy-three (73) are 25 years or less in age. Some of the problems with the older buildings are: energy inefficiency; safety problems due to deterioration of structural, electrical, and mechanical systems; lack of adequate and timely preventative maintenance; and programs simply outgrowing the space available.

Should the present rate of funding continue, the Forests can only expect to replace, as a maximum, one building every two years. At this rate, some buildings will be too old and unsafe for occupancy long before funds become available for replacement. (See attached table of FA&O and Recreation Building Needs to continue current direction).

When buildings are replaced a multifunctional design will be used, thus eliminating the need for several smaller buildings at each site.

The lookout towers are still structurally sound and periodic inspection and maintenance should be all that is needed. Newer methods of fire detection such as aerial observers may do away with the need of some towers.

Included in the above numbers are 16 residences that need to be replaced by more conventional, energy efficient buildings. In addition, two new residences are needed in two headquarters towns where suitable rental property is not available. The high cost of purchasing or building a new house is a key factor in not being able to get young professionals located in small towns. In many of the headquarters towns there is very little turnover in housing, causing some of the professionals to have to commute as much as 40 miles one way each day.

MANAGEMENT DIRECTION

One of the objectives of the Plan is to standardize and operate a transportation system that provides user safety, convenience, and efficiency of operations to accomplish the land and resource management and protection objectives, and complements the State and county road system.

Annual outputs are found in Table 4-2.

Forest-wide management requirements, general directions, and standards and guidelines are provided in the form of Forest Service Manuals and Handbooks addressing transportation systems. Additional directions and standards and guidelines are as follows:

--During the compartment prescription preparation, the District Ranger refers to the transportation analysis to determine system road needs. For each system road identified, the Ranger will document the resource objectives and design criteria, the physical and environmental constraints on the road, the design traffic service level, and the operation and management requirements. This documentation is a part of the compartment prescription and provides the Ranger with a binding management plan for the road system, and also provides engineering the data needed to design a facility that will most efficiently meet the objectives.

--Some of the design criteria for system roads are defined in terms of "traffic service levels" (TSL); there are four (4) A, B, C, and D, with TSL-A being the highest such as arterials and collectors, and TSL-D being the lowest: such as dead-end local roads constructed for a specific purpose. Appendix A gives an explanation of the characteristics of each traffic service level.

--Basically, all traffic service level A, B, and C roads are in-place and may only require some reconstruction to the original standard in order to support the traffic generated by resource use and to protect the road investment and environment.

--Road construction and reconstruction to support timber activities will primarily involve TSL-D and some TSL-C roads.

--Existing woods roads, planned to become part of the Forest Development Road System will be reconstructed, where needed, to TSL-D or C standards on the existing location except for short sections where the alignment may need to be changed to improve or avoid environmental or physical conditions. On TSL-D roads, rutting is controlled only for soil and water protection.

--New system roads will be constructed on the best location considering resource accessibility, environmental and physical conditions. System roads can be designed and constructed or reconstructed to the same low standard (TSL-D) as temporary roads except that better drainage and alignment could be provided.

--Traffic service level "D" roads may be full surfaced, spot surfaced, or unsurfaced depending on season of use and physical-environmental factors. Surfacing will not be utilized to extend logging operations into the wet season.

--On TSL-D roads, dips will be used extensively in lieu of culverts, providing the terrain is suitable. Where needed, culverts and other type drainage structures will be used and, in some cases, temporary drainage crossings can be constructed.

--New and existing TSL-D system roads will be classified as long-term facilities but will generally be managed for intermittent use. This means that the road will be water-barred, seeded for erosion control and wildlife, and closed with an earth mound between periods of use (usually one or more years). While open the roads will be maintained to a level appropriate with use and when closed will be placed in maintenance level one. Roads treated like this may be managed as linear wildlife openings.

--The District Ranger will be responsible for implementation of the road management decisions agreed to by him and the Forest Supervisor. Follow-up on implementation and effectiveness will be accomplished during visits to the Districts.

--The implementation of these road operation and management policies will result in the closure of TSL-D roads that are constructed/reconstructed in the future, whereas many dead-end roads constructed/reconstructed in the past remained open even though the need for an open road did not exist until the next planned resource activity.

Monitoring and Evaluation is found in Chapter 5.

The 10-year Arterial and Collector Program is shown in Appendix A.

The 5-year Forest Highway Program was developed when the Federal Highway Administration, the Mississippi State Highway Department, and the USDA Forest Service agreed on a 5-year development program for the period 1983-1987. The priority for work to be done under the Forest Highway Program is based on the relative needs of the various elements of the National Forest System as determined in the Planning Process. Three projects were approved in this program as follows:

--FH#15, Clear Springs Recreation Area access road, located on the Bude Ranger District, Homochitto National Forest. The project is approximately 4 miles in length and will be improved to asphalt surfacing standards.

--FH#34, Turkey Fork Lake Recreation Area access road located on the Chickasawhay Ranger District, De Soto National Forest. This project is approximately 3 miles in length and will be improved to an asphalt surface standard.

--FH#40, Marathon Lake Recreation Area access road, located on the Strong River Ranger District, Bienville National Forest. This project is approximately 7.5 miles in length and will be improved to an asphalt surface standard.

Completion of these three projects within the five-year period will be contingent upon sufficient Forest highway funding.

The 10-year Local Road Program is shown in Appendix A.

The 10-year Trails Program is shown in Appendix B.

The 10-year FA&O Building Program follows:

<u>Priority</u>	<u>Description</u>	<u>Estimated Cost (1984 Dollars)</u>
1.	Ashe Nursery Chemical & Fertilizer Storage (Replacement)	\$ 201,500
2.	Tombigbee Work Center Bldg.(Replacement)	247,500
3.	Erambert Pollination Lab.	92,500
4.	Ashe Nursery Packing Bldg. Renovation	190,000
5.	Bude Ranger Office Expansion	56,000
6.	Delta Assistant's Residence (New)	80,000
7.	Holly Springs Ranger's Residence(Replacement)	80,000
8.	Ashe Nursery Oil & Grease Storage Bldg.	30,000
9.	Bude Work Center Bldg. (Replacement)	250,000
10.	Homochitto Work Center (New Site)	550,000
11.	Biloxi Work Center Bldg. (Replacement)	250,000
12.	Yalobusha Work Center Bldg. (Replacement)	250,000
13.	Tombigbee Residence (Ackerman) (Replacement)	80,000
14.	Chickasawhay Work Center Bldg. (Replacement)	250,000
15.	Bude Assistant's Residence (Replacement)	80,000
16.	Bude Assistant's Residence (at Work Center) (Replacement)	80,000
17.	Homochitto Assistant's Residence(Replacement)	<u>80,000</u>
		* \$2,847,500

Space Limitation on Residences Constructed = 1300 S.F. Max., excluding garages, carports, attics, and basements. -- Cost Limitation \$65,000. Some costs do not apply against this limitation, see FSM 7300-7314.

* Costs are based on 1984 Program Budget costs with no inflation added.

This list is not all-inclusive; there may be a need for some smaller type buildings, such as Oil, Grease & Paint Storage, Misc. Service or Storage, etc., that cannot be incorporated into a Multifunctional W/C Building.

C&LA-RECREATION CONSTRUCTION

Priority	Description	1984 Cost
1.	6-Unit Toilet/Bathhouse - Choctaw	\$170,000
2.	6-Unit Toilet/Bathhouse - Clear Springs	170,000
3.	Bathhouse with Showers - Big Biloxi	170,000

FIRE

The fire management analysis process (FSH 5109.19) has confirmed that our current wildfire suppression goals for the general forest area are the most cost efficient. These goals are to contain 90% of all wildfires within these time frames and acres: De Soto National Forest, two hours, 38 acres; Bienville, Holly Springs, Homochitto, and Tombigbee National Forests, 1-3/4 hours, 23 acres; Delta National Forest, one hour, 10 acres. These goals are based on the premise that each wildfire ignition will be confined, contained, or controlled depending upon the threat to life and property, damage to resources, and those fires which threaten to escape to private land. Suppression action for the Black Creek and Leaf Wilderness areas will be as described in the Action Plan as approved by the Regional Forester (8-18-80), and is contained in Appendix F of this document.

Prescribed fire will play an important role in the management of the forest under this alternative. The FORPLAN model calls for an annual understory prescribed burning program of slightly more than 165,000 acres. This will serve as an upper limit for the burning program which presently averages about 124,000 acres annually. Because of the various constraints involved such as budget, personnel ceilings, timber sales and weather, actual accomplishment will vary from year to year but will be in this range. Loss of this tool would have a serious impact on wildlife habitat, silviculture, and fuels reduction.

Smoke management and air quality procedures will be practiced in accordance with the Clean Air Act, the State Implementation Plan, and the Southern Smoke Management Guidebook.

HUMAN AND COMMUNITY DEVELOPMENT

The Forest will utilize human resource programs to provide employment, skills training, work experience, and education for both young and elderly citizens in a natural resource environment and to further management aims of the National Forest. These programs foster the Agency's mission to serve the unemployed, underemployed, minorities, economically disadvantaged, youth, and elderly through forestry activities.

In selecting work projects to be completed by enrollees in human resource programs, both the needs of the participants and the work project requirements shall receive consideration. This will