

CHAPTER 1

NEED FOR THE PROPOSAL

Introduction

In compliance with the National Environment Policy Act and other relevant State and Federal laws and regulations, the Forest Service has prepared this Environmental Assessment on the potential effects of management activities such as the regeneration and thinning of timber stands in Analysis Unit 22. The purpose of these actions is to promote forest and ecosystem health in the Project Area. The Analysis Unit for which this assessment is prepared is located on the Homochitto Ranger District, Homochitto National Forest, Amite County, Mississippi.

This Environmental Assessment is prepared in accordance with the format established by the Council on Environmental Quality and need for the proposed management actions and discusses how the Analysis Unit relates to the 1985 Land and Resource Management Plan for the National Forests in Mississippi (Forest Plan); the Final Environmental Impact Statement of the Forest Plan; the Final Environmental Impact Statement for Vegetation Management in the Coastal Plain/Piedmont, Volumes I & II; and the Environmental Impact Statement for the Suppression of the Southern Pine Beetle, Southern Region.

Chapter 1 discusses significant issues that were identified by Forest Service, affected members of the public, and concerned citizens. Chapter 2 describes the “Proposed Action” and alternatives to the “Proposed Action,” including the “No Action” alternative. Chapter 3 describes the natural and human environments potentially affected by the management alternatives and discloses the anticipated effects. The appendices provide additional information on specific aspects of the proposed project. Additional documentation may be found in the project planning record located at the Homochitto Ranger District Office in Meadville, Mississippi.

The Interdisciplinary Team used a systematic approach for analyzing the proposed project and alternatives to it. Planning was coordinated with the appropriate federal, state, and local agencies.

Purpose and Need

Analysis Unit 22 is proposed to respond to the goals and objectives of the Forest Plan, and to help move the Project Area toward the desired future condition. The Forest Plan includes both forest-wide goals and objectives, and area-specific goals based on land suitability. Analysis Unit 22 has a land suitability class of timber production. The need for the “Proposed Action” is directly related to the forest-wide goal to protect or improve the quality of renewable resources. The site-specific objectives for management within the project area are to:

- **Emphasize thinning to reduce southern pine beetle risk and improve forest health and minimize risk to red-cockaded woodpecker and related species habitat** Southern pine beetles are attracted to trees stressed by over-crowding. Thinning is designed to reduce over-crowding and, thereby, increase the growth and vigor of the remaining trees. Areas proposed for thinning are dominated by pine. In some places, hardwood within the pine stands would also be thinned to maintain current proportions of pine and hardwood and to increase the growth and vigor of the remaining hardwoods. Thinning also increases crown development, which leads to greater seed production, which is valuable for natural regeneration of trees and for wildlife as food. Commercial thinning provides economic benefits to local businesses and communities. Occupations in southwest Mississippi are generally related to agriculture, timber production, and oil production. Local communities benefit from the taxes generated by timber activities to improve law enforcement activities, roads, safe drinking water, and public schools.
- **Encourage restoration of longleaf, bluestem grasses, and other components of mixed-pine, pyric communities in areas where they were historically dominant in order to restore native ecosystems and provide preferred and more stable habitat for the red-cockaded woodpecker and related species.** The Homochitto has changed a great deal since the time of the American Indian and the early settlers. Historic records indicate that southwest Mississippi supported extensive mixed pine forests with a significant longleaf pine component. Pines, favored by frequent fires, occupied the ridges and upper slopes. On lower slopes and in the drains, where fire burned at lower intensity, hardwoods flourished. Low-intensity, periodic fire favors oak and hickory over less fire-tolerant species such as sweetgum, yellow poplar, American beech, and Southern magnolia. Therefore, hardmast-producing oaks were dominant in the drains. These forests not only supported game species such as whitetail deer, wild turkey, and Northern bobwhite, but also the endangered red-cockaded woodpecker and a large number of early successional or mature pine-grassland songbirds. Populations of these species are declining across the nation as this important habitats becomes less common.
- **Ensure even flow and long-term availability of quality habitat for the red-cockaded woodpecker. Improve the long-term stability of this habitat.** (Final Environmental Impact Statement for the Management of the Red-cockaded Woodpecker and Its Habitat on National Forests in the Southern Region, page 2).
- **Maintain wildlife habitats, including early, mid, and late seral habitat.** Early seral plant communities are composed of trees, which are 0-10 years of age. Late seral or late successional plant communities are composed of trees >40 years. There may be a combination of pine and hardwood existing in all three seral stand categories. Wildlife species are dependent on at least one seral stand stage to complete their life cycles.

- **Maintain forest stand diversity.** Management prescriptions are applied to manipulate forest stands for the benefit of a variety of forest resources and investments. Management prescriptions proposed in the Analysis Unit 22 Environmental Assessment include regeneration, thinning, prescribed burning, and herbicide applications. These management prescriptions are applied in different combinations to a number of forest stands throughout the project area. Prior to any management prescriptions, the existing forest types include immature loblolly pine, mature loblolly and shortleaf pine, and mature pine-hardwood forest types. After management prescriptions are applied, the stands would be managed to promote mixed-pine and additional pine-hardwood forest types. In seedtree-regeneration and thinning, shortleaf pine is given management priority.

The Analysis Unit 22 Environmental Assessment evaluates the “Proposed Action” and four additional management alternatives in detail. The “Proposed Action” was formulated in response to the objectives identified by the Interdisciplinary Team as well as the potential environmental and economic impacts and issues identified by affected individuals and organizations. Also considered in the development of the alternatives were the Forest Plan and other standards and guidelines designed to produce a balanced program of market and non-market outputs.

Tiering to Higher Level Plans and Documents

National forest planning takes place at several levels: national, regional, forest, and project levels. Analysis Unit 22 is a project-level analysis. Its scope is confined to issues concerning the effects of the project. It does not attempt to address decisions made at higher levels. It does, however, implement direction provided at those higher levels.

In developing this Environmental Analysis, regulations of the National Environmental Policy Act of 1969 and the National Forest Management Act of 1976 were used. This assessment was also tiered to the following higher-level documents and analysis.

- National Forests in Mississippi Land and Resource Management Plan as encouraged by 40 CFR 1502.2 and to all amendments made to the Forest Plan.
- Final Environmental Impact Statement of the Vegetation Management in the Coastal Plains/Piedmont, Volumes I and II and all amendments.
- Environmental Impact Statement for the suppression of the Southern Pine Beetle, Southern Region.
- Environmental Assessment for Interim Guidelines for Managing within $\frac{3}{4}$ Miles of Red-Cockaded Woodpecker Colonies.
- Final Environmental Impact Statement for the Management of the Red-cockaded Woodpecker and its Habitat on National Forests in the Southern Region.

The Forest Plan uses land suitability classes to guide management of the National Forest lands within the Homochitto National Forest. The suitability of National Forest lands for timber production was evaluated by management areas. The Forest has been divided into twelve management areas, which are comprised of analysis areas. The analysis areas fall into two general groupings: those allocated to other resource uses (lands not suitable for timber production) and those suited to timber production. Analysis Unit 22 has a land designation of “suitable for timber production”.

Desired Future Conditions

The forest is dynamic and changing. All forests progress slowly from birth to death through a variety of changes in age class and species mixes, depending upon environmental events, which occur through its life. In nature, forests are renewed by natural catastrophes. These events may affect small openings or thousands of acres. Also in nature, one successional stage frequently covers a large area as a result of fire relationships, and potential effect of insect and disease expanding over large areas unchecked. However, with the limited public lands in Mississippi and the East, in general, and the interface between private homes and ownerships, risk of large catastrophic losses is not considered acceptable to the public.

Under management, many potential catastrophic events, such as southern pine beetle epidemics and large fires, can be managed to minimize forest losses, reduce public hazards, and provide a greater level of stability over time. This stability is maintained through vegetative management activities, which include prescribed burning, thinning and regeneration harvests applied on a scheduled basis, depending upon landform and species. Therefore, in a managed forest all stages of succession will be present from stands of seedlings and grasses through immature and mature pine stands, to the hardwood type which is considered to be the climax stage (in the absence of fire). This will provide continuing habitat for plants and animals that may do well during one stage of succession but poorly during another (Forest Plan, page 3-10).

The desired future condition includes healthy forests of balanced age classes, which would include ages ranging from young stands to trees of harvest age. A specific objective in pine stands would be that southern pine beetle hazard would be no greater than “medium” as determined by the Mississippi B Southern Pine Beetle Hazard Rating model. (Appendix K)

The road system would provide public access to private lands within the management unit and for recreational uses such as hunting and touring, while complying to the extent reasonable with road density standards for management of wildlife species common to the area, and providing for management access including access for timber harvest. The primary outputs of this project would be the harvest and removal of pine and hardwood roundwood and sawtimber products to meet vegetative management objectives and a system of well maintained, open roads providing basic access. The remainder of the roads would be closed except to provide periodic access for management activities. Within areas allocated to late seral species, the desired future condition would increase habitat capability for late seral associated wildlife species and maintain or increase non-game populations. The late seral stage is where most den and snag development occurs.

Soil stability and water quality are good within Analysis Unit 22 with the desired future condition to maintain this quality through time. The project area favors infrequent entry and species mixes, which can be sustained for longer periods than current loblolly pine rotations based upon the steepness of slopes and the potential for soil and watershed damage. Species such as longleaf pine would be a preferred species in these sites. Fully stocked pine stands, particularly loblolly, generally require thinning on a 10-year entry period for the first 40 to 50 years in order to reduce pine beetle hazard and maintain stand and individual tree vigor. Field observations by the prescriptionist and the Zone soil scientist indicate that it would be preferable to enter most of the steeper sites only three or four times in an extended rotation in order to provide longer periods of time between entries and minimize long term impacts.

Within areas allocated to late seral species, the desired future condition would increase habitat capability for late seral associated wildlife species and maintain or increase non-game populations. The late seral stage is where most den and snag development occurs.

Desired and Current Conditions for AU-22 (Table 1.1)

DESIRED CONDITIONS	CURRENT CONDITIONS
(Vegetation) A mixed-pine community on uplands and upper slopes of ridges, dominated by longleaf and shortleaf pine on the uplands, with loblolly pine occurring more frequently on lower side slopes and within drainages.	Over 80% of the acres in this analysis area are dominated by loblolly pine, while only 4.5% of the acres have a significant longleaf pine component. The majority of pine/hardwood stands are also dominated by loblolly pine.
The desired conditions above are limited by the ability to prescribe-burn on a periodic basis. Within the burn block the desired condition is as stated, but outside the burn block the overall objective is more mixed pine/hardwood, since regeneration and success of longleaf pine cannot be assured without fire.	
(Vegetation) Hardwoods occurring throughout the area, increasing in number and variety on lower slopes and in bottomlands.	162 acres of this analysis area are classified as pure hardwood. 531 acres, or 11% of the forested acres are classified as Pine/Hardwood, with hardwoods occupying at least 30% of the overstory.
(Vegetation, Wildlife) A full range of forest age classes, ensuring a wide variety of habitats for wildlife and recreation, and long-term productivity of forest products. In addition, a habitat model which will bring in red cockaded woodpecker.	Of the 3,290 forested acres within Analysis Unit 22, approximately 50%, are 60 years old or older. 10% of the acres are less than 10 years old now but will move out of early seral conditions within five years.
(Roads, Wildlife) Provide public access to private lands, recreation uses, and management access including access for timber harvest, while complying to the extent reasonable with road density standards for managing wildlife species.	The current density of open roads in the Analysis Unit 22 project area is approximately 1.01 miles of road per square mile of land. The majority of these open roads are County or Forest Service maintained, with a native gravel surface.
(Late Seral) Within areas allocated for late seral emphasis, increase habitat capability for late seral associated wildlife species and maintain or increase non-game populations.	Four stands, totaling 127 acres, have been designated for "Late Seral" emphasis in Analysis Unit 22. No vegetation management or road activity is planned or proposed in these areas.
(Recreation) Provide an increasing supply of dispersed recreation opportunities, primarily through increased access.	Public lands in the Analysis Unit 22 area are used for hunting, fishing, hiking, and other dispersed recreation activities. Hunting is the most popular activity in and around AU-22.

The desired future condition of vegetation within the Analysis Unit 22 Project Area is a mixed-pine community on uplands and upper slopes of ridges. Analysis Unit 22 resides within the Southern Mississippi Valley Silty Uplands Resource Area and is located in the central portion of the Homochitto National Forest. Landforms typical of this resource area generally consist of narrow ridges with semi-steep slopes draining southeasterly towards the Homochitto River. The desired future condition of Analysis Unit 22 is a mixed-pine community on uplands and upper slopes of ridges. Longleaf and shortleaf pine would dominate these uplands with loblolly pine occurring more frequently on lower side slopes and within drainages. Hardwoods would occur throughout this analysis area increasing in number and variety on lower slopes and in bottomlands. A full range of forest age classes is also the desired future condition, therefore, ensuring a wide variety of habitats for wildlife and recreation and long-term productivity of forest products.

Of the approximate 3,290-forested acres within this analysis area, 1,670 (50-percent) are 60 years old or older. Long-term desired future condition of Analysis Unit 22 is to manage stands for a multi-age class forest structure. Based upon the current age distribution and other resource mitigating factors, the long-term desired future condition would require several entries to accomplish. These short-term actions should contribute towards balancing age classes over time and insure an even flow of forest products including timber and wildlife.

Stands within the prescribed burning boundary will primarily be managed for a mixed-pine-fire-maintained ecosystem with pine-hardwood in the major drains and lower slopes. This includes periodic prescribed burning and longleaf pine restoration. After thinning or regeneration, pine density would be such that the next entry can be delayed without stagnation or unacceptable insect and disease losses. And the pine beetle hazard rating is not expected to rise into the high hazard classification prior to the next entry.

Outside the prescribed burning boundary, the desired future condition of the Analysis Unit 22 Project Area would be the forest types of hardwood, pine-hardwood, and pine. Analysis of inventory data determines appropriate management objectives. After thinning or regeneration, pine density should be reduced to a level that would prevent stagnation or unacceptable insect or disease losses. Hardwoods would be thinned as necessary to provide proper hardwood density and promote adequate crown development. Thinning surplus pines would reduce the southern pine beetle hazard, reducing possible losses to southern pine beetle outbreaks and ensuring public economic returns. Regeneration areas should have sufficient retained inclusions within the stands to provide effective wildlife corridors along streamside management zones.

As defined in the Forest Plan, the desired future condition of recreation within Analysis Unit 22 includes an increasing supply of dispersed recreation opportunities, which will be provided primarily through increased access due to logging activities (Forest Plan, page 4-79). Dispersed recreation use may also be increased through improvement of the trail system (Forest Plan, page 4-2). The Recreation Opportunity Spectrum identifies the area within Analysis Unit 22 as a "Roaded Natural" setting (Forest Plan, page 4-41). According to the Forest Plan, the National Forests in Mississippi are open to camping except where restricted because resource damage or user conflicts are expected to occur (Forest Plan, page 4-41).

Visual management needs would be addressed through mitigation that would be implemented across Analysis Unit 22. For the desired future condition of the visual resource, the Forest Plan provides the following direction: “The most obvious change in the Forest will be in timber management. As timber production is increased, more activities will be evident and, consequently, more effects will be viewed.” The Forest may take on a more “managed” look. This condition will be enforced as management intensity and utilization are increased (Forest Plan, page 4-79).

The likely visual results of intensive, even-aged timber management over the planning horizon is a visible distribution of age classes. More stands of varying size will become evident. This distribution has the positive aspect of providing visual variety to the landscape (Forest Plan, page 4-80). Projections of future visual conditions are based on visual variety, comparisons of total acres harvested, visual absorption capacity of the land and comparisons between estimated volumes of harvest and growth (Forest Plan, page 4-80).

The forest is dynamic and changing. All forests progress slowly from birth to death through a variety of changes in age class and species mixes, depending upon environmental events, which occur through its life. In nature, forests are renewed by natural catastrophes. These events may affect small openings or thousands of acres. Also in nature, one successional stage frequently covers a large area as a result of fire relationships, and potential effect of insect and disease expanding over large areas unchecked. However, with the limited public lands in Mississippi and the East, in general, and the interface between private homes and ownerships, risk of large catastrophic losses is not considered acceptable to the public.

Under management, many potential catastrophic events, such as southern pine beetle epidemics and large fires, can be managed to minimize forest losses, reduce public hazards, and provide a greater level of stability over time. This stability is maintained through vegetative management activities, which include prescribed burning, thinning and regeneration harvests applied on a scheduled basis, depending upon landform and species. Therefore, in a managed forest all stages of succession will be present from stands of seedlings and grasses through immature and mature pine stands, to the hardwood type which is considered to be the climax stage (in the absence of fire). This will provide continuing habitat for plants and animals which may do well during one stage of succession but poorly during another (Forest Plan, page 3-10).

Desired Future Conditions and Present Conditions for Treatment Stands (Table 1.2)

Compartment Number	Stand Number	Year of Regeneration	Present Condition Forest Type	Desired Future Forest Type
277	5*	1930	Loblolly Pine – Mature Saw	Mixed-Pine
277	6*	1930	Loblolly Pine – Mature Saw	Mixed-Pine
277	7*	1925	Yellow Pine - Mature Saw	Mixed-Pine
277	9*	1933	Loblolly Pine - Mature Saw	Mixed-Pine
277	10*	1931	Loblolly Pine - Mature Saw	Mixed-Pine
277	22*	1981	Loblolly Pine - Mature Pole	Mixed-Pine
277	28*	1933	Yellow Pine - Mature Saw	Mixed-Pine
279	11	1901	Loblolly Pine - Mature Saw	Pine-Hardwood
279	12	1987	Loblolly Pine Mature Pole	Pine-Hardwood
279	14	1909	Loblolly Pine Mature Saw	Pine-Hardwood
279	38*	1901	Yellow Pine - Mature Saw	Mixed-Pine
280	3	1926	Loblolly Pine Mature Saw	Pine-Hardwood
280	6	1927	Loblolly Pine Mature Saw	Pine-Hardwood
280	7	1971	Loblolly Pine Mature pole	Pine-Hardwood
280	22	1926	Loblolly Pine Mature Saw	Pine-Hardwood

* Within planned prescribed burning boundary

Location

Analysis Unit 22 is located in Amite County, Mississippi as follows:

Section(s)	Township	Range
13, 17, 19, 20, 21, 22, 23, 24, 25, 26	T. 4 N.	R. 2 E.

Analysis Unit 22 consists of approximately 15,613 total acres. Approximately 3,290 acres of National Forest land are in compartments 250, 277, 278, 279, and 280 of the project area. This proposal was developed for these five compartments and includes a total of approximately 844 proposed treatment acres.

Approximately 12,323 acres of private land in the Analysis Unit 22 are not included in this proposal, but were considered in the analysis of the direct, indirect, and cumulative effects of the “Proposed Action” and alternatives. Adjacent landowners were made aware of this project proposal. A vicinity map showing the general location of AU-22 is located in Appendix B of this document. Other maps associated with this project, including alternative maps, are also contained in Appendix B.

The “Proposed Action”

The Homochitto Ranger District proposes to treat approximately 79 acres by the irregular seed-tree regeneration method; approximately 157 acres by the clear cut with reserves regeneration method to restore a historic longleaf pine component to areas where frequent prescribe burning is scheduled; and approximately 56 acres by the clearcut with reserves regeneration method to establish pine-hardwood stands in areas where frequent prescribed burns are not scheduled. This represents approximately 292 acres of total regeneration treatments.

Other harvest methods would include thinnings on approximately 552 acres. Areas proposed for thinning include the following: approximately 402 acres of sawtimber thinnings and approximately 150 acres of first thinnings in mixed-pine poletimber stands.

Approximately 95 acres would be planted in longleaf pine at a spacing of 8X8 or 680 trees per acre. Approximately 79 acres would be naturally seeded with the use of seed trees. The remaining acres to be regenerated, and that are not within the planned prescribed burning boundary would be planted in loblolly pine at a spacing of 10X10 or 436 trees per acres.

A total volume of approximately 18,582 hundred cubic feet (CCF) would be harvested. No sale would exceed 5 million board feet (MMBF). On regenerated sites, herbicides would be used in a manner consistent with the direction identified in the Final Environmental Impact Statement Vegetation Management in the Coastal Plain Piedmont. Herbicide treatments would include the hand tool application of Oust[®], Garlon 3A[®] and 4[®], Velpar[®], and Arsenal[®] for the purposes of release and site preparation.

Transportation needs to support this project are provided by County Roads 118, 118A, 191, 192, and 192A and Forest Development Roads as indicated on the “Transportation System Map (Appendix B) In order to implement this decision, road maintenance is required on approximately .9 miles of these roads, road reconstruction is required on approximately 9.4 miles and road construction is required on 1.4 miles of road on right of ways. Within the immediate vicinity of the sale, approximately 2.1 miles of temporary roads would be constructed or reconstructed as necessary to remove timber. To access a portion of the timber sale area, approximately 4 rights-of-ways will be needed. Other roads associated with the Analysis Unit 22 Project can be found in Appendix B under the “Transportation Map” heading.

Approximately 1,553 acres of prescribed burning would be completed on a three-year interval starting one year after completion of harvesting. Within the burning area, the objective is to maintain a mixed-pine forest type. Outside of the prescribed burning area, the emphasis would be for management of a pine, pine-hardwood, or hardwood forest type.

Treatment Summary for stands in the “Proposed Action” (Table 1.3)

Treatment	Compartment	Stand	Total Acres§	Current Condition	Desired Future Condition	Purpose and Need	How Stand meets the Purpose and Need
Mixed-Pine Irregular Seed-tree	279	14	79	Loblolly Pine Mature Saw Overstocked	Pine-Hardwood	Maintain Wildlife Habitats, Maintain Forest Stand Diversity	Stand is reverting back to early seral habitat, which some species prefer. This treatment will give short leaf pine priority in the stand over loblolly and longleaf, creating more diversity. Restore stands to a healthy state of mixed pine-hardwood.
Clearcut with Reserves for Longleaf Pine Restoration *	277	7 28 38	50 45 62	Yellow Pine - Mature Saw Overstocked	RCW-Mixed Pine	Encourage Restoration of Longleaf, Ensure availability of RCW habitat, Maintain Wildlife Habitats, Maintain Forest Stand Diversity	Stand is reverting back to early seral habitat, which some species prefer. Stand is being planted to longleaf pine on the ridges and upper slopes as future habitat for RCW and as an attempt to restore the longleaf ecosystem. Loblolly pine is planted on the lower slopes as well as having pine and hardwoods grow naturally which will provide for stand diversity. Restore stands to a healthy state of mixed pine.
Clearcut with Reserves for Pine-Hdwd. Restoration *	280	3	56	Loblolly Pine Mature Saw Overstocked SPB Mortality	Pine-Hardwood	Maintain Wildlife Habitats, Maintain Forest Stand Diversity	Stand is reverting back to early seral habitat, which some species prefer. Adjacent young stands have grown out of the early seral stage, while stand 3 will once again provide an early seral setting. Without fire, this stand will develop into a Pine-Hardwood community. Restore stands to a healthy state of mixed pine hardwood.
Sawtimber Thin	277 277 277 277	5 6 9 10	143 59 51 68	Loblolly Pine – Mature Saw Overstocked	RCW Mixed Pine	Emphasize Thinning to reduce SPB Risk and improve forest health	Thinning to a basal area of less than 70 will reduce the pine beetle threat to these stands to low value based on the coastal plains hazard rating system. Favoring longleaf pine will provide stand diversity. Fire in the stand will keep the understory under control and leave the habitat open, which will be ideal for RCW.

Treatment	Compartment		Total Acres§	Current Condition	Desired Future Condition	Purpose and Need	How Stand meets the Purpose and Need
Sawtimber Thin	279	11	28	Loblolly Pine - Mature Saw Overstocked	Pine-Hardwood	Emphasize Thinning to reduce SPB Risk and improve forest health	Thinning to a basal area of less than 80 will reduce the pine beetle threat to these stands to low value based on the coastal plains hazard rating system.
	280	6	26				
	280	22	27				
First Thin	277	22	47	Loblolly Pine - Mature Pole Overstocked	RCW Mixed Pine	Emphasize Thinning to reduce SPB Risk and improve forest health Maintain Wildlife Habitats	Thinning to a basal area of less than 80 will reduce the pine beetle threat to these stands to low value based on the coastal plains hazard rating system. After treatment, habitat will once again be available to a more diverse group of wildlife. This treatment reduces the risk of future habitat of the RCW.
First Thin	279	12	68	Loblolly Pine Mature Pole Overstocked	Pine-Hardwood	Emphasize Thinning to reduce SPB Risk and improve forest health Maintain Wildlife Habitats	Thinning to a basal area of less than 80 will reduce the pine beetle threat to these stands to low value based on the coastal plains hazard rating system. After treatment, habitat will once again be available to a more diverse group of wildlife.
	280	7	35				

§ Acres in this environmental assessment have changed from the predecisional environmental assessment based upon improved mapping technology. Although the acres have changed, the actual stands and there locations on the ground have not. All acres are approximate.

~ Overstocked stands not treated within the analysis unit were eliminated by the ID team due to restraints imposed by adjacent stand conditions.

Public Involvement

The Council of Environmental Quality defines scoping as “. . . an early and open process for determining the range of issues to be addressed and for identifying the significant issues to be addressed and for identifying the significant issues related to a proposed action” (National Forest Management Act, 40 CFR 1501.7). Scoping was accomplished through a combination of methods including the mailing of scoping packages, public advertisement in newspapers, contact with interested public, and evaluation from a Forest Service Interdisciplinary Team. As a cooperating agency, the United States Fish and Wildlife Service was also consulted for a review of the proposed actions and associated Biological Evaluation.

On July 20, 2000, a legal notice was published in the Clarion-Ledger, the newspaper of record for the Homochitto National Forest. This notice began the 30-day official comment period regarding Analysis Unit 22. Written comments received during the official comment period have been included in Appendix H with Forest Service responses following the letters.

Issues and Concerns

The scoping process discussed above generated several issues. These issues have been divided into two groups: “issues to be analyzed” and “other issues not analyzed”. “Issues to be analyzed” are those issues that would be used as a basis for formulating alternatives to the “Proposed Action”. “Other issues not analyzed” are those issues developed from scoping comments that are determined to be outside the scope of this document. Those issues that do not suggest alternatives to the “Proposed Action” will also be addressed in the text of this environmental assessment. Based upon the responses and inputs from scoping, the following issues and concerns were identified:

Issues to be Analyzed

Issue 1. Soil Productivity

- a. Erosion:** There is concern that timber harvest may negatively affect soil productivity by increasing erosion.
- b. Compaction:** There is concern that the weight of machinery used to harvest timber and build roads may decrease soil productivity by causing soil compaction, which impedes root growth by increasing soil density and decreasing soil porosity.
- c. Cumulative Effects:** There is concern that, on any particular site, the cumulative effect of all management actions over time may reduce soil productivity. All of the cause-effect relationships listed above may apply.

Issue 2. Water Quality

- a. Sedimentation:** There is concern that management actions (timber harvest, road construction, prescribed fire), alone or in combination with all other actions within the analyzed watershed, may result in sediment loads that would negatively affect beneficial uses, which may include healthy aquatic communities, recreation, and livestock or human consumption. Sedimentation may be increased if eroded soil reaches streams.
- b. Herbicides:** There is concern that herbicide application may result in herbicides moving into streams and having toxic effects to aquatic life. The Forest Service needs to fully develop and consider alternatives that do not use any herbicides. The Forest Service needs to consider the impact of the inert chemicals in the herbicides and pesticides.
- c. Channel Stability:** There is concern that herbicide application may result in herbicides moving into streams and, alone or in combination with other environmental contaminants (synergism), having toxic effects to aquatic life.
- d. Wetlands, Floodplains, and Riparian Areas:** There is concern that timber harvest, road construction, and prescribed burning may alter vegetation, hydrologic, or soil characteristics of wetlands, floodplains, or riparian areas, impacting their ecological function of maintaining clean water.

Issue 3. Air Quality

The issue of air quality degradation as a result of burning must be addressed. There is concern that smoke from prescribed burns may negatively affect local sites sensitive to air quality (urban areas, heavily-traveled roads, chicken farms, airports, etc.).

Issue 4. Vegetation

- a. Age Class Diversity and Old Growth:** There is concern about how timber harvests will affect old forests, which are the most difficult to replace and are valued for their beauty, as a setting for recreation and seeking solitude, and as critical habitat for some wildlife species. There is concern for the lack of regeneration in older classes.
- b. Hardwood and Pine Monoculture:** There is concern that timber harvest, reforestation activities, and prescribed burning may reduce the abundance of hardwood, converting hardwood forests or changing diverse mixed forests into pine monocultures. There is concern about the use of uneven-aged management in shade-intolerant loblolly pine forests.

c. Understory Diversity: There is concern that timber harvests, site preparation, and prescribed fire may reduce the native diversity of understory plants. There is also concern about how management actions may affect the population viability of threatened, endangered, or sensitive plants.

Issue 5. Forest Health

a. Southern Pine Beetle: There is concern about how management actions may affect the risk of southern pine beetle infestations, which decrease with increases in the growth and vigor of pine stands.

b. Windfirmness: There is concern that timber harvests may increase loss of trees to blow-down by removing support of surrounding trees. This is the case especially with partial cuts.

Issue 6. Threatened, Endangered, and Sensitive Species

a. TES Animals: There is concern about how management actions may affect population viability of the red-cockaded woodpecker. Negative effects may occur through direct injury or mortality, or through modification of habitat conditions that result in increased mortality or decreased reproduction and recruitment. Conversely, positive effects may occur if mortality is reduced or reproduction and recruitment are increased.

b. TES Plants: There is concern about how management actions may affect population viability of threatened, endangered, or sensitive plants. Negative effects may occur through direct injury or mortality, or through modification of habitat conditions that result in increased mortality or decreased reproduction and recruitment. Conversely, positive effects may occur if mortality is reduced and/or reproduction and recruitment are increased.

Issue 7. Management Indicator Species

a. MIS: There is concern about how management actions may affect populations of management indicator species. There is concern that management indicator species for early successional habitat be changed to the “only creature that truly requires the type of habitat created in Forest Service timber sales”.

b. Game Species: There is concern about how management actions may affect populations of game species (whitetail deer, wild turkey, Eastern gray and fox squirrels, Northern bobwhite, and ducks) in demand by the hunting public.

c. Mature Forest Wildlife and Fragmentation: There is concern that management actions may fragment habitats, negatively affecting area-sensitive, forest-interior species, including neotropical migratory birds. The analysis needs to address the predation impacts from logging.

- d. Young Forest Wildlife:** There is concern that early successional species may not require the “devastation of Forest Service timber sales”.
- e. Open Roads:** There is concern that open roads may negatively affect the suitability of habitat for some wildlife by allowing frequent human disturbance, poaching, and mortality by collision with vehicles. The analysis needs to determine if there are any roads in the project area that are not included in the Forest Transportation Plan.

Issue 8. Economics

- a. Local Businesses:** There is concern about how management actions may affect local businesses dependent on the national forests. Businesses associated with harvest and manufacture of wood products may be affected by the amount of timber made available for purchase. Businesses associated with recreational uses of national forests may be affected by how recreational settings or opportunities are changed.
- b. County Returns:** There is concern about how management actions may affect current revenue sharing payments to local counties for use in funding schools and roads.
- c. Harvest Sustainability:** There is concern that timber harvest levels are not at sustained yield levels.

Issue 9. Recreation

- a. Recreational Settings:** There is concern that management actions may change recreational settings resulting in changes in recreational use. Recreational use may be affected by modifying access through road construction or closure or by changing vegetation density, modifying the apparent naturalness of an area by adding or eliminating signs of human disturbance, or by modifying amenities that assist the recreational user.
- b. Visual Quality:** There is concern that timber harvests and vegetation management, including prescribed burning, may affect the visual beauty in the project area by creating visible disturbance, such as exposed soil, stumps and slash, browned or scorched vegetation, or unnaturally abrupt changes in vegetation.

Issue 10. Heritage Resources

There is concern about how management actions may affect historical sites within Analysis Unit 22. Such resources may be damaged or moved out of context by soil disturbance during timber harvest, road building, or fireline construction.

Issue 11. Public Health and Safety

a. Herbicides: There is concern that herbicides applied to the environment may negatively affect public health. There is concern that herbicides applied, alone or in synergism with other environmental contaminants, may negatively affect public health. Contact with herbicides may occur directly during visits to the national forest, or through movement in surface or ground waters. The Forest Service needs to consider the secondary impacts, including impacts to non-target species, water supplies, and human health, of the toxic chemicals.

Issue 12. Civil Rights and Environmental Justice

There is concern that economic and environmental effects of management actions be fairly distributed among people without regard to race, color, religion, sex, national origin, age, or handicapping condition. Neither benefits nor negative impacts should fall disproportionately upon anyone because of these factors.

Other Issues Not Analyzed

Issue 1. Soil Productivity

a. Fire and Soils: The issue of soil heating needs to be considered. The issue of loss of organic matter needs to be considered. The issue of loss of nitrogen from burning needs to be considered. The issue of loss of other nutrients needs to be considered. The issue of erosion and sedimentation as a result of burning needs to be considered. The issue of mercury contamination needs to be considered.

These issues are beyond the scope of the Analysis Unit 22 Environmental Analysis. The impacts of prescribed burning will be evaluated in an environmental analysis evaluating the District's prescribed burning program. Conducting an evaluation of prescribed burning is considered an opportunity outside of this analysis. Proposed areas where fire may be applied will be described but will not include a full analysis of fire and air quality concerns. This comment was, therefore, eliminated from an in-depth analysis for the purposes of this project. These issues are also discussed further in Chapter 3.

b. Microorganisms: There is concern that timber harvest and prescribed fire may reduce the soil microorganisms that are important components of soil productivity.

The primary change associated with soil microorganisms would be from the loss of overstory. Exposure to the sun and loss of the annual replacement of the leaf litter are likely to result in some changes. Burning has historically been a natural component of the southern ecosystem. There is no scientific evidence that the suppression and restoration activities proposed in this project would destroy all microorganisms or that the site would not recover over time as current conditions return. The effect would be the result of pine beetle activity, and the proposal serves only to limit this impact. Further, there are no identified rare or sensitive microorganisms, which would warrant study or special treatment in this project. This issue is restated in Appendix H of this document.

Issue 2. Water Quality

a. Caves, Springs, and Groundwater: The analysis needs to consider groundwater and subsurface water flow.

This issue does not have a direct cause and effect relationship to the proposed actions in Analysis Unit 22. The Homochitto National Forest does not have the underlying rock layers to support cave formation. Therefore, an analysis of the effects on caves is out of the scope of this project.

There may be some effect on water yield due to the loss of pine overstory trees as a result of the proposed actions. The respondent appears to relate this issue to the increased water yield associated with the removal of timber. Trees transpire large quantities of water and replace

decomposing litter with annual leaf and litter fall. This improves filtration into the soil and reduces the amount of water that actually leaves the watershed in the form of ground water. Intermediate cuttings, such as thinnings, which are slated for Analysis Unit 22, would have very little effect upon subsurface water flow, as enough trees still remain (60 to 70 square feet per acre) to reduce this flow of water. Even increased water flow, as a result of reproduction treatments, would be short-lived as regeneration would return the site to current conditions more rapidly and limit long-term effects. A number of the soil and water issues identified above have a direct relationship with this project and could potentially have a very minor and indirect impact on water yields. These issues are further discussed in Chapter 3 and restated in Appendix H of this document.

Issue 5. Forest Health

a. Site-specific Data: The Forest Service needs to use site-specific data when making management decisions. The analysis needs to disclose all the site-specific data that is being used for this project.

Studying the entire population is usually out of the question. Sometimes, it is impossible because some of the elements are physically inaccessible. In other cases, it is uneconomic. Even when all the elements of the population are available for examination, they may be so numerous that a complete census is not justified; often for most practical purposes, sufficiently accurate results may be more quickly and inexpensively obtained by examining only a small part of the population (Huntsberger and Billingsley 1987). The data that we use to base our decisions is a site-specific sample of the project area and is applicable to the management decisions. Restatement of this issue can be found in Appendix H.

b. Timber sale need: The need for the timber sale needs to be addressed. The alternative of private lands providing the timber needs to be considered. The issue of the impacts of local landowners having to compete with below-cost government timber needs to be considered.

It is the policy of the Congress that all forested lands in the National Forest System shall be maintained in appropriate forest cover with species of trees, degree of stocking, rate of growth, and conditions of stand designed to secure the maximum benefits of multiple use sustained yield management in accordance with land management plans. The Forest Service is [required] under the National Forest Management Act of 1976, Sec. 14(a) to [manage forests] for the purpose of achieving the policies set forth in the Multiple-Use, Sustained-Yield Act of 1960 (74 Stat. 215; 16 U.S.C. 528-531) and the Forest and Rangeland Renewable Resources Planning Act of 1974 (88 Stat. 476; 16 U.S.C. 1601-1610), the Secretary of Agriculture, under such rules and regulations as he may prescribe, may sell, at not less than appraised value, trees, portions of trees, or forest products located on National Forest System lands.

The Forest Service is also required under the Endangered Species Act to manage for the habitat of the red-cockaded woodpecker. Management involves the cutting and, in some

cases, the removal of timber in order to maintain the habitat for this endangered bird. The above paragraphs are quotations from the National Forest Management Act of 1976 under which the Forest Service is required to manage its forests. All of these issues violate this law and the Endangered Species Act and are, therefore, out of the scope of this project. Restatement of these issues can be found in Appendix H of this document.

Issue 7. Management Indicator Species

a. Predation Impacts from Logging: The analysis needs to address the impact of increased populations of nest predators on forest interior species.

The recent discussions about nest predators, such as the brown-headed cowbird, come mainly from research conducted in the Midwest where the forest was truly fragmented, i.e., trees surrounded by cornfields. Recent research in the Southeast concerning the effects of regeneration areas within forested blocks has not confirmed the midwestern data (L.W. Burger, Mississippi State University, personal communication).

On the Homochitto National Forest, large forested tracts are maintained as breeding areas for neotropical species requiring forested ecosystems. While at any given time, some of the forest may be younger than others; it is still forest. Harvested stands adjacent to forested areas are regenerated within a year of the harvest, thereby, reducing the fragmented habitat preferred by the brown-headed cowbird and the resultant threat of nest parasitism. The issue of the predation impacts from logging, in the case of the proposed actions of the Analysis Unit 22 Project, is beyond the scope. Further discussion or restatement of this issue can be found in Chapter 3 and Appendix H, respectively, of this document.

b. Mortality of Animals from Logging-related Effects: The analysis needs to address the impacts of increased mortality due to “road kills” and other logging-related effects.

There is no feasible way to determine if road mortalities resulted from logging, as there is no feasible way to determine how many other deaths will occur or “what kind of death these creatures will suffer”. Animals die from disease, predation, or starvation, as they become less competitive with age. There is no means to determine whether deaths experienced result from normal population dynamics or from activities related to the Analysis Unit 22 Project. This issue is, therefore, out of the scope this project. Further discussion can be found in Appendix H of this document.

c. Baseline Data: The Forest Service needs to obtain baseline data for all MIS (management indicator species).

According to National Forest Management Act regulations (36 CFR 219.19), management indicator species are selected to indicate the effects of management on wildlife. Some are selected because the effect of management on that particular species is of direct interest to people. Examples of this type are species that are hunted or those that are on endangered or

threatened lists. Other species are selected because effects to them are believed to indicate effects to other species that use the same habitat types or components. National Forest Management Act regulations place emphasis on this “indicator” function of management indicator species.

The Forest Plan follows the National Forest Management Act’s lead. This emphasis continues despite professional critiques that refute the assumption that one species’ population response can adequately indicate another’s (Landres et others 1988). The National Forest Management Act intends the use of management indicator species, in part, is to ensure that national forests are managed to “maintain viable populations of existing native and desirable non-native vertebrate species”. Because indicator species cannot adequately represent all species (Landres et others 1988), new strategies are emerging for accomplishing this goal.

One strategy is the coarse and fine filter approach (Nature Conservancy 1982, Noss 1987, Hunter 1990). This strategy assumes that most species can be maintained at viable levels by providing a diversity of habitat conditions across a landscape. Providing a diversity of habitat types serves as the coarse filter. However, some species with narrow habitat requirements, or, for which, viability is of concern require special attention (or a fine filter) to ensure viability.

This analysis uses habitat availability for management indicator species as the coarse filter for ensuring that a mix of habitat types is provided across the landscape. The Biological Evaluation serves as the fine filter to ensure that those species most at risk of losing viability (threatened, endangered, and sensitive species) are not negatively affected. This combination of approaches ensures that all species on the Homochitto National Forest are maintained or are moving toward viable population levels. Restatement of this issue can be found in Appendix H of this document. Further discussion of baseline data occurs in Chapter 3.

Issue 8. Economics

a. Exports: The issue of exports needs to be considered. Trees cut down east of the Mississippi can be exported to foreign countries.

The Homochitto National Forest is bound by the laws, regulations, and policies of the United States Government; the North American Free Trade Agreement; and other such initiatives. As a partner in the world economy, free trade, as a means of balancing imports, is National Policy and beyond the authority of the Forest Service or the Homochitto National Forest. As a result, this issue is beyond the scope of the Analysis Unit 22 Project. Appendix H restates this issue.

Issue 12. Public Health and Safety

a. Prescribed Fire: The issue of impacts of prescribed burning must be considered. The worldwide effects of fire on global warming must be considered.

The impacts of prescribed burning will be analyzed in a separate environmental assessment evaluating the District's prescribed burning program. Conducting an evaluation of prescribed burning is considered an opportunity outside the scope of this analysis. Proposed areas where fire may be applied will be described but will not include a full analysis of fire and air quality concerns. This comment was, therefore, eliminated from an in-depth analysis for the purposes of the Analysis Unit 22 Project.

The Homochitto National Forest's prescribed burning program and the output of smoke as a result of this program is so small and infrequent in relation to the worldwide effects of fire on global warming that this issue is also beyond the scope of this Environmental Analysis. The Forest Service conducts all prescribed burning according to the Environmental Protection Agency's Interim Air Quality Policy on Wildland and Prescribed Fires, which "advocates the use of prescribed fire while ensuring protection of air quality and public health" (Unknown 1998). Furthermore, the Environmental Protection Agency recognizes "that fire is essential to effective ecosystem management and that an increase in carefully conducted prescribed burning can improve the quality of fire-dependent wildlands" (Unknown 1998). Restatement of these issues can be found in Appendix H of this document.

Project Implementation and Inherent Mitigation

The proposals in Analysis Unit 22 adhere to the Forest-wide standards and guidelines established in the Forest Plan and the FEIS analyzing that plan. Management requirements necessary for achieving goals and objectives are referred to as standards and guidelines. They define how management will be performed. The Forest-wide standards and guidelines are described in Chapter 4, pages 2-166 of the Forest Plan. Key Forest-wide standards and guidelines in the Analysis Unit 1 project area address recreation, wildlife, timber, soil, water and air, lands, minerals, facilities, and fire.

Additional standards and guidelines can be found in the Final Environmental Impact Statement for Vegetation Management in the Coastal Plain/Piedmont, Volumes I & II; and the Environmental Impact Statement for the Suppression of the Southern Pine Beetle, Southern Region. Additional mitigation is described in the “Summary of Harvest Treatments section below and Appendix C. Important actions and specific mitigation considerations are described below for summary of harvest treatments, streamside management zones, and wildlife habitat inclusions and reserve clumps.

Summary of Harvest Treatments

The forest is a dynamic ecosystem, made up of a variety of tree species; each species has a biological life span and certain conditions that must be available for that species to thrive. Variety or diversity in the forest is generally described as forested “stands” which are made up of trees of like species and ages. Forest management strives to provide a mix of these age classes and species to ensure long-term productivity and diversity; this ensures habitat for many other species and the opportunity to regularly manage production of commercial timber related resources. Forest management as an art and science includes the full range of cultural treatments that could be used to keep the forest thriving and healthy.

Regeneration

Trees, like all living things, do not live forever. The art of replacing old trees, either naturally or artificially, is called regeneration. This term also applies to new growth that develops. Regeneration cuttings are made to remove trees and create environments favorable for establishing regeneration. (Smith 1986) Regeneration replaces a mature stand with an early seral stand. The regeneration methods discussed here include **irregular seed-tree** and **clearcut with reserve groups**.

Irregular seed-tree

The irregular seed-tree method of regeneration retains seed trees in clumps of about ½ acre to 2 acres distributed across the stand. These clumps break up the visual impact and provide mature areas in the young stands after regeneration. This method employs seed trees grouped in reserve clumps and streamside management zones as the primary source of seed for regeneration. Additional seed trees may be retained between the clumps when distances between the reserve areas necessitate. The reserve clumps would have sufficient seed trees around the perimeter but would also protect areas where hard mast producing hardwoods are concentrated with pines in order to retain wildlife benefits and mast production for the future stand.

Clumps would also be positioned as necessary to meet visual quality objectives. Reserve clumps would not be cut after successful regeneration but, instead, would be retained for 3 or more entries to provide inner stand diversity. The reserve clumps could be retained indefinitely, depending upon future decisions and direction. Longleaf pines of sufficient form and quality to respond and develop would also be retained. The reserve clumps would comprise 15% to 20% of the acreage for stands larger than 20 acres. The “Proposed Action,” alt. 2 and alt. 3 include approximately 294, 409, and 294 acres of regeneration, respectively, of which approximately 79 acres would be accomplished through the irregular seed-tree method.

Irregular seed-tree regeneration is a form of even-aged regeneration. Based upon Forest Plan direction and the stated purpose and need for the Analysis Unit 22 Project, the even-aged silvicultural system is appropriate for timber management purposes for the proposed seedtree treatment in Compartment 279, Stand 14, based upon the following:

1. These stands have mature loblolly pines that are showing increasing signs of stress and associated mortality.
2. The existing pine seed trees are suitable for the regeneration of a mixed pine and pine-hardwood stand.
3. There are sufficient numbers of well-formed, seed-producing pines to provide adequate numbers of well-distributed seed trees.
4. There is suitable rootstock for desirable hardwood regeneration. Loblolly and shortleaf pines have light seeds, which can be wind distributed up to ½ miles. The proximity of the reserve clumps, supplemented by additional seedtrees between clumps, as needed, will insure adequate distribution of seed.
5. The species involved are shade intolerant and irregular seed-tree regeneration is a silviculturally sound method of regenerating these species.

The irregular seed-tree harvests would result in a suitable yield timber flow that does not impair the productivity of the land. Also, quality renewable resources are protected and/or improved through forest management actions. A discussion of why uneven-aged management was not considered in detail is included in Chapter 2.

Regeneration by the irregular seed-tree method typically leaves approximately 7 to 10 pines per acre on site. The seed trees would mostly be left in clumps ranging from ½ to 2 acres in size

with scattered seed trees reserved between the clumps. Mature loblolly pine would comprise most of the seed trees, while any longleaf pine would also be marked as reserve trees so as to increase species diversity.

Pines selected for retention would include those trees that are dominant or codominant in the present stand, display good form and crown characteristics, and have other traits indicating good genetic potential. They should be reasonably vigorous and have a life expectancy of greater than 10 years following the harvest. Sometimes there may be a compromise between form and vigor. The number of reserve trees and seed trees depends upon the tree species, size, condition, and seed-producing ability.

Scattered seed trees would be selected and given a distinguishing mark by a certified marker trained in recognition of suitable seed trees. Reserve clumps would be marked with a boundary. Any thinning within the clumps would include designated and marked trees only, in accordance with mitigation for wildlife and reserved clumps, which is discussed later in this chapter. Seedtrees scattered between clumps would be harvested once successful regeneration is secured.

Clearcut with reserve groups

The clearcut with reserve groups regeneration method removes most of the trees in a stand but retains varying numbers of reserve trees to attain goals other than regeneration. As proposed in the Analysis Unit 22 Project, reserve groups ranging from ½ to 2 acres would be retained in inclusions and streamside zones in order to meet visual and hardwood component objectives and provide for wildlife habitat needs. These reserve areas would total approximately 15% to 20% of the treatment acres. In addition to these larger reserve areas, individual hardwoods and small clumps of two to three trees would be left scattered throughout the stand.

Scattered longleaf pine would also be left, depending upon the objectives of regeneration. In selecting reserve areas and leave trees, hardwoods of good form and longleaf pine would receive priority. However, some clumps would be positioned to mitigate visual impacts rather than to optimize hardwoods and longleaf pines. This would provide a relatively high degree of age class and site diversity to increase forest heterogeneity and ecosystem stability (Forest Plan 4-5). These groups should contain good mast producers as well as potential den trees.



Photo 1.1- An aerial view of Forest Service Regeneration Units on the Homochitto National Forest showing Reserve areas within clearcuts and SMZ protection.

The reserve clumps would be retained for three or more entry periods. This would provide in-stand habitat and age class diversity through mid-rotation of the new stand. Potentially, these reserve areas could be retained indefinitely, depending upon future decisions and direction. Where feasible, cavity trees, snags, and older relic trees can also be retained. The scattered single trees and small clumps would be retained as snags. In combination with scattered trees and reserve areas, there would be sufficient trees retained to meet the Forest Plan direction for retaining snag trees.

This method varies substantially from the common perception of clearcutting which does not provide for reserve trees. It also exceeds the minimum standards for the Forest Plan, which provides for ½ acre per 20 acres of harvest, primarily for the purpose of retaining small wildlife clumps. Above these minimums, the Forest Plan provides for additional reserves as necessary to meet mitigation. All mitigation is linked directly to the National Forests in Mississippi's Forest Plan, which sets minimum resource protection but also sets management goals (see the Final Environmental Impact Statement “Purpose and Need”, Chapter 1) and provides for additional mitigation based upon identified issues and concerns. The Final Environmental Impact Statement specifically identifies the clearcut harvest method as a preferred method but provides that all even-aged harvest methods “can be modified for special circumstances” (Final Environmental Impact Statement 1-12 & Forest Plan 4-37).

The basis for additional mitigation in the form of reserve trees and inclusion clumps includes, but is not limited to:

1. “[Providing] a visually acceptable landscape by maintaining or upgrading existing visual condition” (Forest Plan 4-1);
2. Limiting visible opening size (Forest Plan Table 4-1);
3. Maintaining appropriate hardwood components across the forest and within stands (Forest Plan 3-3, 4-5, 4-6, and 4-9);
4. Developing standards and guidelines for species dependent upon riparian habitats (Forest Plan 4-5);
5. Setting limits of regeneration along streams (Forest Plan 4-9).

These needs, along with other mitigations requirements, result in retaining larger portions of regeneration areas in unharvested conditions. The resultant stand does not have the appearance of a “classic clearcut” but appears to be a mix of openings and unharvested areas of a later age class. Two distinct age classes are visible. Retained areas also provide for recreation as the stand moves through its early seral stages where dense seedlings and brush, would otherwise restrict use of the entire stand.

While the harvest remains technically a clearcut based upon the Forest Plan definition of even-aged treatments, which include artificial regeneration, the over-all appearance is more like the modified shelterwood treatment incorporated into the Forest Plan as amended by the Final Environmental Impact Statement for the Management of the Red-cockaded Woodpecker and its Habitat on National Forests in the Southern Region. It cannot be described as a modified shelterwood only because natural regeneration is not being used as the primary means of stand replacement.

With respect to visual appearance, this treatment would, therefore, comply with the “Chief’s” guidelines” for reducing clearcutting and the national initiatives to manage ecosystems in a manner which mimics nature. The term “clearcut with reserve groups” is intended to be descriptive of these differences. A description of proposed management activities within streamside management zones and reserve inclusions is provided later in this section. The use of clearcutting also complies with the following circumstances of the Chief’s Working Guidelines for Ecosystem Management, which states: “Clearcutting would be limited to areas where it is essential to meet forest plan objectives and involve one or more of the following circumstances:

1. To preclude or minimize the occurrence of potentially adverse impacts or insect or disease infestations, windthrow, logging damage, or other factors affecting forest health;
2. To provide for the establishment and growth of desired trees or other vegetative species that are shade intolerant.”

This determination is in accordance with the requirements of 16 U.S.C. 1604(g)(3)(f)(i) and (ii).

Applications of the Clearcut with Reserves Groups Regeneration Method

In the “Proposed Action,” Alt. 2 and Alt. 3, the clearcut with reserve groups regeneration method is incorporated for the restoration of two distinct forest communities. A description of these communities and the basis for regenerating by this method is provided below:

Mixed Pine Regeneration with Longleaf Pine Component: These sites are capable of producing yellow pine stands with a natural mixture of longleaf, shortleaf, and loblolly pines, often times with a substantial hardwood component. Restoration of mixed pine stands is appropriate on pine sites within areas where prescribed burning can be scheduled every 3 to 4 years. This would tend to develop a grassy, herbaceous understory over time.

This mixed-pine, pyrotypic community with longleaf component is representative of the historic interior pine forests found on the Homochitto National Forest prior to initial logging. When this area was cut 70 to 80 years ago, the mixed-pine, pyrotypic community was all but lost causing a severe decline in the population of red-cockaded woodpecker.

The “Proposed Action” and Alt. 3 propose to restore approximately 157 acres to this mixed-pine, fire-dependent community. “Alt. 2” proposes to regenerate approximately 214 acres to this community type. Once harvesting is completed, the stands would be site prepared and planted to longleaf pine. This would accomplish the desired future conditions for pine sites within the prescribed burning boundary and provide for the management of mixed or yellow pines including longleaf pine. The reserve inclusions and individual clumps would mitigate the impact of this regeneration method; however, over time, some of the reserve trees may be lost due to windthrow, insects, and other natural forces.

Longleaf pine is a suitable species for the sites where this treatment is prescribed. The natural range of longleaf pine includes most of the Atlantic and Gulf Coastal Plains from southeastern Virginia to eastern Texas and south through the northern two-thirds of the Florida peninsula. This range includes the present boundaries of the Homochitto National Forest. This range establishes longleaf pine as a southern yellow pine as described in “Silvics of North America, Volume 1.”

The Forest Plan describes the yellow pine working group as consisting of loblolly and shortleaf pine-dominated overstories. Pure stands (greater than 70%) of a single species do exist, but stands of mixed yellow pine are more common on the Homochitto. Longleaf pine has been identified on the Homochitto National Forest as a component of these pine and mixed stands. The longleaf pine working group in the Forest Plan (4-26) occurs in largely pure stands. The Homochitto National Forest contains few pure stands of longleaf pine, largely due to the District’s heavily dissected terrain, which results in considerable micro-site variation across the stand.

Historically, longleaf pine did not occur in pure stands across the Homochitto National Forest. Longleaf dominated the ridges and upper slopes and was mixed with loblolly and shortleaf pines. The longleaf pine component diminished off the ridges and the other southern pines dominated

the lower slopes. Presently, only remnants of these past longleaf component remains to be seen mixed with loblolly and shortleaf pines. There is insufficient seed source to restore the historic longleaf component by natural means. If not planted, the historic role of longleaf will not be restored and the longleaf pine component will continue to decline much like it has in the past 70-80 years.

Planting Longleaf pine will not result in a pure stand. Loblolly and shortleaf pines and hardwoods are still expected to occur. This action would result in the positive implementation of four goals set forth in the Forest Plan. (4-1)

1. Protect and/or improve the quality of renewable resources. Longleaf pine is a longer lived species than loblolly or shortleaf and results in a more sustainable forest community.
2. Protect and manage important historic, cultural, and natural aspects of our national heritage.
3. Provide a visually acceptable landscape by maintaining or upgrading the existing visual condition.
4. Provide for a diversity of plant and animal communities.

Longleaf or shortleaf pine found in a regeneration area, if suitable, should be part of the reserved trees to provide potential species diversity. Hardwoods may also be selected as reserve trees providing they have good form and are desirable management species. The hardwood reserve groups will range in size from 0.5 to 2.0 acres on the lower slopes. Where good hard mast producers are available, smaller clumps of up to four trees may be scattered between the larger leave trees.

Mixed Pine-Hardwood Regeneration: These sites are not currently within the Homochitto National Forest's prescribed burn plan. Even though soils on most of these sites are favorable to longleaf pine, in the absence of fire, hardwood midstory would not be controlled except through periodic silvicultural contract. Even with silvicultural treatments, establishment and maintenance of the grassy and low shrub understory would be erratic. The typical interior pine forest community of the past could not be established. Also, longleaf pine would be more difficult to establish, resulting in failures and increased costs to the public.

In the absence of fire, sites on the Homochitto have a tendency to produce a mixed pine and hardwood characteristic with a well-developed hardwood understory, which would shade out longleaf pine in its early stages, along with grasses and low shrubs. However, over time, the hardwood component and potential for hard mast production would increase. Therefore, these sites are more favorable to pine/hardwood communities that do not require fire as part of their life cycle.

The "Proposed Action" and Alt. 3 include regeneration using the clearcut with reserve groups regeneration method in which reserve trees are left for mitigation. The "Proposed Action" and Alt. 3 to regenerate approximately 56 acres back to a pine-hardwood community. Alt. 2

proposes to regenerate 128 acres and convert or maintain these stands in a pine-hardwood community.

Pines selected for retention would include those that provide for an even distribution of trees across the area, display good form, and have other traits indicating good genetic potential. Selection priority of pines for retention is as follows: 1) longleaf 2) shortleaf 3) loblolly. For hardwoods, priority for retention includes trees that have good form, cavity nesting opportunities, and/or hard mast production.

Once harvesting is completed, the clearcut areas would be site-prepared and planted with widely spaced loblolly pine seedlings. The desired future condition for the clearcut with reserve groups stands is to manage for a mixture of yellow pines and hardwoods without any prescribed burn plans. Some of the reserve trees may be lost to windthrow, insects, and other natural forces.



Photo 1.2 – An example of a regeneration unit managed for a mixture of yellow pines and hardwoods

In some cases, stands currently classified within the yellow pine working group would be regenerated to pine-hardwood stands in order to conform with the natural relationships which occur in the absence of fire. The Forest Plan allows the conversion of one working group to that of another. The Forest Plan states that the decision to convert from one forest type to another will be based upon several social, biological, and economic factors such as soil type, hard mast needs, timber markets, presence of rootstock, and species composition of the stand presently occupying the site. (Forest Plan 4-112)

Each management area within the Forest Plan, including the Bude and Homochitto, has an assignment for prescriptions. The actual allocation of these prescriptions may vary from those scheduled due to several reasons. It has been established in the Forest Plan that a suitable site-species relationship will allow a conversion from one working group to another where none was previously planned. (Forest Plan 4-118)

Optimality of Clearcutting

The use of clearcutting has been limited by direction of the Chief of the Forest Service in his 1330-1 letter dated June 4, 1992, and by the National Forest Management Act (NFMA) at 16 United States Code 1604 (g)(3)(F)(1). Clearcutting will be used only where it is the best means of producing a specific desired result. The Forest Plan identified clearcutting as providing the best mix of resource outputs while meeting the Land Management Plan objectives with the most favorable economics. The Forest Plan supports us in creating natural systems and using professional judgment to do so.

Clearcutting has been found to be the optimum method of achieving the Homochitto National Forest's desired future conditions based upon its ability to provide early seral habitat, maintain habitat diversity, and maintain the quality of our renewable resources. Where restoration of a historic longleaf pine component is the objective, a suitable seed source for this species is not present. The existing dominant species, loblolly pine, is a prolific seeder with aggressive initial growth characteristics. Longleaf pine is a highly shade intolerant species. Natural regeneration methods, including uneven-aged regeneration strategies, cannot provide for longleaf regeneration in the absence of a seed source, and would result in excessive competition if under-planting or other methods were used to establish a longleaf component.

Clearcutting is optimal because it removes the loblolly seed source and provides appropriate light conditions favorable to longleaf pine. In the absence of adequate natural longleaf pines, clearcutting and planting is the only reasonable silvicultural method that can achieve the desired future condition of establishing longleaf pine shelterwood conditions.

Where pine-hardwood regeneration is prescribed, the objective is to develop a high component of hardmast-producing hardwoods (oaks). These species are highly shade intolerant and regenerate best in open light conditions. Pines do not regenerate from rootstock and require seedtrees for natural regeneration. Leaving loblolly and shortleaf seed trees would provide a prolific seed source for these species, which is likely to produce a large number of pine seedlings.

On the Homochitto, pines tend to rapidly over-top hardwoods and shade them out, occupying the site and creating pure pine stands. If higher shade conditions such as shelterwood or uneven-aged management exist, pine growth rates are controlled, but there is insufficient light for successful hardmast species growth. More shade tolerant hardwoods, such as beech and magnolia, proliferate.

The production of hard mast was a significant public issue in the Forest Plan which sets an objective of 40% if the hardwood component in hardmast producing species. It is unlikely that this could be achieved by natural or uneven-aged methods without extensive additional treatments. Harvesting all pines by clearcutting and replacing the pine component by planting on a wide spacing with limited ground clearing during site preparation controls pine density and provides the appropriate light conditions and growing space for hardmast hardwoods. As a result, clearcutting represents the optimum method for pine-hardwood regeneration in this project.

Thinning

Sawtimber Thinning

Sawtimber thinning is an even-aged management tool considered as a forest health treatment. Thinning is appropriate in all working groups where justified by stem density or forest health maintenance needs. The Forest Plan (4-38) identifies thinning as appropriate in older stands in order to “salvage volume which would otherwise be lost because of natural mortality from over-crowding,” when regeneration is to be delayed 20 years or more. Based upon changing Forest Service harvest direction, the next entry's regeneration cannot be projected at this time. However, considering current mitigation and southern pine beetle hazard reduction recommendations, and in light of the history of infestation on the Homochitto National Forest, current direction dictates that high hazard stands and clumps be thinned.

In the Analysis Unit 22 Project, sawtimber thinning within the prescribed burning area will create an open pine dominated, grass and shrub understory community which would have developed naturally had the historic fire regime been maintained. In pre-settlement times, this community type was the most common across the region. Through harvest and development, its occurrence has been critically reduced. The listing of several species such as the endangered red-cockaded woodpecker and the decline of a number of Neotropical migrant birds have been at least partially attributed to this loss.

Sawtimber thinning with prescribed burning would open the canopy and encourage a more complex understory dominated by grasses, enhancing wildlife habitat. Southern pine beetle vulnerability would also be reduced, and stands would potentially be retained in a healthy condition for a longer period. The declining populations of Neotropical migrant birds and a variety of other species associated with this habitat type would benefit, too.

When the long-term objective is to manage for mixed pine and the stand is currently mixed pine sawtimber, the thinning objective is to reduce pine density. Commercial thinning also removes low quality hardwoods from drier upland sites, allowing more sunlight to reach the forest floor. By combining a more open forest canopy with prescribed burning, a diverse understory can be achieved. All hard mast producing hardwood trees of 12 inches diameter at breast height (dbh) and larger, as well as some hardwoods as small as 10 inches dbh, would be retained to provide a hardwood component in these stands. These trees are of sufficient size to tolerate the periodic prescribed fires planned for this category.

In mixed pine sawtimber thinnings, where the stand is located within the established prescribed burning area, the stand will be managed for mixed pine. The order of trees preferred for retention is longleaf, shortleaf, and then loblolly pine. This is based upon their fire ecosystem relationship. These stands are thinned to a target basal area of 70 with an average basal area range between 60 and 80. Generally, these stands are thinned to a minimum spacing of 20 feet between pine leave trees.

Mast producing hardwoods over 12 inches dbh may be retained and protected during harvest. Pine removal to exclusively release hardwoods would not be practiced. Desirable hardwoods of good form found on moist micro-sites may be retained and protected regardless of diameter. Other hardwoods within these micro-sites may be harvested.

In mixed pine sawtimber stands that remain outside of the established prescribed burning block boundaries, the thinning objective is to reduce the pine basal area and encourage the release of more mast producing hardwoods. These stands will be thinned to a target basal area of 60 with an average basal area range between 50 and 70. This thin will provide larger openings within pine stands in order to allow shade intolerant hardwoods, such as oaks, to establish themselves.

The establishment of well-formed hardwoods may take several rotations to accomplish the stand goal of a pine-hardwood community. Generally, the pines within these stands are thinned to a minimum spacing of 20 feet between pine leave trees. Well-formed and vigorous hardwoods over 10 inches dbh may be retained and protected from damage during harvest.

In stands classified as a pine-hardwood stand, the management action will be to thin pine clumps in order to reduce the threat of southern pine beetle infestation leaving a minimum spacing of 20 feet between pine leave trees. Hardwood thinning will occur only where hardmast producing species are presently established. This management action will produce stands with a larger species and structural diversity. Stands outside the established prescribed burning boundary fall within this category.

The basal areas given for management actions on the different forest types are targets only. Due to natural gaps in the overstory created by natural events, thinning will not produce an evenly grid-like pattern and may have basal areas lower than the target. Areas with a basal area lower than the target basal area in a stand may still have trees removed for stand health reasons. All harvest treatments would protect residual trees by limiting log lengths to 50 feet, which would be monitored by the sales administrator.

First thinning

First thinnings are proposed on pulpwood stands 15-30 years old, which have not been previously thinned. The objectives of a first thinning are to enhance wildlife habitat by reducing the stand density, create a spacing of 9-27 feet between trees, and retain trees that display the best vigor and health. This type thinning is a forest health treatment applied prior to the time

trees produce sufficient seed for regeneration. Therefore, first thinning is a forest health treatment and cannot be associated with even or uneven-aged management.

In a mixed pine pulpwood stand, the first thinning would target a spacing of 15-20 feet between residual trees. Loblolly pine is the least preferred residual tree. The highest priority residual tree is longleaf pine and then shortleaf pine. Hardwoods would be thinned to release pines as necessary and to provide proper spacing. However, within all first thinning stands, reserve hardwoods would be marked within drains and riparian zones for retention as well as protection from harvest operations. All "relic" longleaf pines would be retained. A hard mast component will be retained in accordance with the Forest Plan. This component will be primarily managed on lower slopes and in drainages where preferred site conditions exist and fire burns at lower intensity, increasing the potential for long term development.

In a pine-hardwood stand, the first thinning would target a spacing of 15-20 feet between leave trees. Longleaf and shortleaf are the preferred leave trees. This is based upon their fire ecosystem relationship. Hard mast producing hardwoods with good form will be retained and care taken to avoid damaging them during the harvest.

Due to gaps in the overstory created by natural events, first thinning will not produce an evenly grid-like pattern and may have basal areas lower than the target. The general spacing guides above are intended to provide a residual target basal area of approximately 60 square feet per acre, but individual locations may range from 50 sq. ft. to 70 sq. ft., and existing gaps may result in greater variation at specific locations. This is somewhat lower than for mature stands, but once thinned, the residual trees have less resource competition and grow more quickly. This allows stand canopies to quickly fill openings and to obtain characteristics associated with mature forests. Also, vigor is closely associated with resistance to southern pine beetle infestation. In general, first thinnings create understory conditions valuable for a variety of wildlife species.



Photo 1.3 -- Dense stand of young pine less than 30 years old at risk to insect and disease attack.(Stand 12, compt. 279)



Photo 1.4 – An example of a stand after its first commercial thin. Note the gaps in the overstory allowing more light and growing space for existing trees(Stand 1, comp 278)

The stands proposed for first thinning are below effective regeneration age. Therefore, the first thinning does not commit the stands to even-aged or uneven-aged management. The first thinning is a forest health treatment applied to carry the stands forward to an age where regeneration regimes may be considered. Thinning “deals primarily with the tending of stands that have already been established or regenerated. The most important kind of tending or intermediate cutting is thinning, which is a kind of partial cutting designed to guide the production of stands along desirable channels,” (Smith 1986, page 46).

Long-term Objectives

In both mixed pine and mixed pine-hardwood stands, it is anticipated that intermediate treatments would be required several entries and, potentially, for more than one rotation in order to achieve the desired future condition of each stand.

After harvest, mixed-pine stands are essentially non-stocked. By the second year, even if planted or natural seedlings are present, grasses, herbaceous plants, and woody brush dominate the site. Management species represent only a small number of the thousands of stems per acres and are generally overtopped by the surrounding brush in the first years. However, by the fifth year, management tree species, once again, begin to dominate the site. Even under moderate competition, loblolly pines would tend to outgrow competition because moisture and soil relationships favor pines. The long-term structure of the stand would be dependent upon intermediate treatments after the fifth year.

Longer-term overstory selection would be achieved by multiple entry thinnings. Typically, only about 100 trees reach large sawtimber size, and mature pine stands on the Homochitto National Forest rarely have more than 60 dominants and codominants. Older stands have even fewer trees. Thinning would be used to remove loblolly and shortleaf pines and other species, as necessary, in order to favor the appropriate mixes of pines, including longleaf pine, and hardwoods. Therefore, appropriate stands could be developed from a wide variation in initial stocking.

The general expectation is that the desired future could be reached at mid-rotation, or age 50 for most stands, even though some may require a longer period. The decision to be made on this project cannot commit actions for an extended period such as this. Future public opinions and demands, available treatments, and a variety of other factors would influence future decisions. However, initial actions provided by the proposed mixed pine regeneration, pine/hardwood regeneration and thinning treatments would provide the basis for the long-term restoration of the historic forest structure.

The development of a pine/hardwood stands particularly from pine stands that are currently outside of the prescribed burning boundary is a long-term activity. As noted above, stands pass through a series of early seral development stages before tree species dominate, and soil and site conditions generally favor early dominance of the pine component. Unlike mixed pine stands, pine-hardwood stands do not have periodic prescribed fires that would discourage hardwood

development. Over time, pre-commercial and intermediate thinnings would be used to reduce the initial 200 to 300 planted pines and any natural pine regeneration to approximately 20 to 40 stems.

Thinnings would also serve to favor development of at least 40% hardmast producers in the hardwood component (Forest Plan 4-9). Therefore, stands may be initially dominated by pine but develop into pine-hardwood structure by mid rotation. During this time, pines and low quality hardwoods serve as trainers, which provide for improved form development of the mature hardwoods. If rotations extend beyond 80 to 100 years, the short-lived loblolly pine component is likely to fade below 30% of the dominant and codominant stems, and the stand may take on a hardwood structure. The initial means of obtaining this managed progression is control of initial release, quality form development, and selection of preferred species mixes. This action provides the initial resource conditions that would be developed into the proposed management type through future decisions and actions.

Streamside Management Zones

Streamside management zones include those areas next to perennial and intermittent drains. For perennial drains, the buffer strip on both sides of the drain would be a minimum of one chain (66 feet) but would average three chains or about 198 feet. For intermittent drains, the buffer strip on both sides of the drain would be a minimum of one-half chain or 33 feet but would average two chains or 132 feet.

Typical streamside management zone boundaries will be located at the point of the side slope that provides a definite break between the ridge and the bottom of the slope. Actual width at any point along the drain will depend upon the landform at that point. Areas with steep ridges might be narrower than three chains or 198 feet. Areas that are broad and flat might go well beyond the three-chain average distance.

The minimum standard provided by the Forest Plan (Amendment 6) and the Final Environmental Impact Statement for Vegetative Management in the Coastal Plain/Piedmont is to maintain a minimum one-half chain (33 feet) filter strip along perennial and intermittent streams. Additional width is required based upon landform and floodplain width. Except for stream-bank trees on perennial streams, timber may be harvested from the filter strips, but equipment-use is restricted to designated crossings (Forest Plan, Appendix M) and no more than 10-percent disturbance of the organic layer (Final Environmental Impact Statement for Vegetative Management in the Coastal Plain/Piedmont). Coordination states that streamside management zones are primarily for the protection of water quality, although they provide many other benefits in the form of wildlife habitat, fisheries, species diversity, and aesthetics.

This minimum standard will meet soil and water quality objectives. However, timber management guidelines for meeting hardwood coordination state: "Within filter strips the objective is to maintain healthy, vigorous stands of hardwood trees with a high component of hard mast (Forest Plan, page 4-8)." Since one of the objectives of the Forest Plan is to maintain existing hardwoods up to 20 percent for each square mile (Forest Plan, page 4-5), expanding

streamside management zones to provide this hardwood component is an option supported by the Forest Plan Environmental Impact Statement.

Expanded streamside management zones have also been an important issue developed through local scoping. In the early 1990's, a group of local hunters and non-hunters with environmental interests formed a group called "Concerned Citizens for Conservation". The hardwood issue was one of their primary concerns and the group focused on streamside zones and other leave-areas that provided substantial wildlife benefit. Their objective was to retain hardwoods in riparian areas and on upper slopes where hard-mast species were more abundant. Retention of wider streamside management zones and well-distributed inclusions has largely satisfied this group's concerns, and they have supported District management decisions that incorporated these features.

Since the Forest Plan was developed, additional information has been published related to the relationships between streamside management zone widths and wildlife habitat benefits. In 1989, Dr. James Dickson of the Southern Forest Experiment Station found the maintenance of squirrel populations was not achieved until zone widths exceeded 50 meters or approximately three chains on each side of the stream. Populations of reptiles and amphibians could be retained at zone widths of 30 to 40 meters but responded favorably to zone widths of over 50 meters. Small mammals such as harvest mice, which are characteristic of early successional conditions invaded narrow streamside management zones, which extended less than 25 meters on each side of the stream, but populations progressively diminished as zones exceeded 50 meters. This indicates that the characteristics of mature habitat are lost in narrow streamside management zones even though some older trees and hard mast producers are retained.

The Forest Plan directs that some mitigation be provided for species associated with riparian and late seral conditions, and directs that "standards and guidelines for species that totally depend on riparian habitat will be developed." (Forest Plan, page 4-5). Also, it directs that "hardwoods will also be managed in stringers and inclusions." (Forest Plan, page 4-6). Dr. Dickson's study indicates that coordination minimums of 1/2 acre per 20 acres of harvest (Forest Plan, page 4-9) and scattered clumps and snag trees are ineffective in providing this habitat. Even as regeneration advances in age to mid-rotation, it appears there would be insufficient suitable habitat to provide a base location for squirrels, reptiles, and amphibians to effectively use the remainder of the stand under plan minimums. Therefore, through hardwood and wildlife habitat diversity coordination guidelines, the Forest Plan supports retention of wider streamside management zones and larger clumps.

Where the predominant forest type is pine, streamside zones may be crown-thinned. Where the predominant forest type is pine-hardwood or hardwood, streamside management zones would rarely be thinned, and thinning would be limited to the removal of pines and lower grade hardwoods with the specific objective of releasing or developing the hard mast component in accordance with Forest Plan objectives (Forest Plan, page 4-6). Pines may also be removed from the edge of the streamside zones. In all cases, directional felling techniques would be used to the extent reasonable to fell trees to the outside of the area or in a direction where disturbance would

be minimized. The intent is to maintain the mesic community and its full range of understory, midstory, and overstory vegetation.

Minor disturbance to brush and understory vegetation is acceptable, but trees will not be marked for harvesting if they cannot be removed without causing damage to residual trees selected for release, or changing the over-all character within the streamside management zone. In future entries, sufficient basal area may need to be removed to secure advanced reproduction of desired species. However, no site preparation or regeneration methods would be conducted inside these areas during this entry.

Within the streamside management zone, the objective is to reduce pine stocking to between 50 and 70 percent of the total basal area to reduce the risk of southern pine beetle infestations and release potential hard-mast producers. However, an overstory basal area of 80 to 85 square feet per acre would be maintained to retain the fully shaded, open-understory condition of the sites. Canopy or cover of streams would be maintained or increased when possible and riparian areas maintained (Forest Plan, page 4-62).

Wildlife Habitat Inclusions and Reserve Clumps

Leave trees, inclusions, and tree clumps are provided in the regeneration areas to meet a variety of management and coordination needs. Clumps are intended to vary in size from ½ acre to 2 acres. Forest Plan justification and coordination benefits for these large, well distributed leave areas are documented above under “Streamside Management Zones.” The combination of streamside management zones and clumps are intended to comprise approximately 15% to 20% of stand acres. These clumps mitigate visual impacts and provide the wildlife coordination targeted in the Forest Plan. These clumps can also be used to maintain concentrations of mast-producing hardwoods.

Pine clumps are to be thinned, and pines and hardwoods may be thinned from hardwood and pine-hardwood clumps to release or develop additional mast production. Skidding through clumps is acceptable on designated roads and trails to access other portions of the stand on the most desirable, least-soil impacting route. However, basal areas should remain somewhat higher than the general thinning areas (about 75 to 85 square feet per acre), and every effort should be made to directionally fall trees to the outside of the clump. Disturbance of the understory and midstory should be minimized to maintain the closed-forest, open-understory character of the clumps. Trees should not be removed if they would damage specific coordination trees, such as longleaf pine or large mast producers 12 inches diameter at breast height or larger, which the thinning is intended to enhance.

Monitoring

Monitoring activities are divided into several broad categories: Forest Plan monitoring, routine implementation monitoring, validation monitoring, and project-specific effectiveness monitoring. The National Forest Management Act requires that National Forests monitor and

evaluate their forest plans (36 CFR 219.11). The Forest Plan (Chapter 5) includes the monitoring and evaluation activities to be conducted as part of Forest Plan implementation. Monitoring requirements in Chapter 5 of the Forest Plan would be met under all alternatives.

Validation monitoring is considered longer-term research data collection to verify if implementation and effectiveness monitoring assumptions remain valid. No validation monitoring is scheduled for this proposal. Routine implementation monitoring is part of the administration of a timber sale contract. Trained timber sale administrators and road inspectors ensure that standards and guidelines are being met. Trained state and federal wildlife biologists and botanists would accomplish plant and wildlife monitoring. Soil scientists would monitor soils and soil properties including productivity.

Monitoring would ensure that the appropriate standards and guidelines and mitigation measures are followed to protect water quality, heritage resources, wildlife habitat, and other natural resources. Effectiveness monitoring is done to determine if management objectives are being met, and if mitigation measures are adequate. Monitoring for occurrence of southern pine beetle infestations would occur throughout Analysis Unit 22. More monitoring information is found within Appendix C.