Environmental Assessment
For
Analysis Unit 23
With Possible
Forest Plan Amendment

Homochitto National Forest
National Forests in Mississippi
Amite and Wilkinson Counties

August 2011

Homochitto Ranger District
Bruce Prud'homme, District Ranger

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Table of Contents

1.0 PURPOSE OF AND NEED FOR ACTION 01
1.1 Introduction.....01
1.2 Documents Incorporated by Reference.....03
1.3 Decision to be Made 04
1.4 Public Notice and Issues 04
2.0 THE ALTERNATIVES CONSIDERED 07
2.1 Alternative 1 (No Action) 07
2.2 Alternative 2 (Proposed Action) 07
2.3 Alternative 3.....11
2.4 Alternatives Considered But Not Addressed in Detail 15
2.5 Comparison of Alternatives 15
2.6 Protective Measures ……...16
2.7 Monitoring……..19
3.0 AFFECTED ENVIRONMENT & ENVIRONMENTAL CONSEQUENCES 20
3.1 Physical Environment 20
3.1.1 Soils.....20
3.1.2 Water.....26
3.1.3 Air 31
3.1.4 Minerals and Special Uses……..32
3.1.5 Climate Change……...34
3.2 Biological Environment 36
3.2.1 Vegetation 36
3.2.2 Forest Health.....42
3.2.3 Threatened and Endangered Species 47
3.2.4 Forest Sensitive Species.....57
3.2.5 State and Local Concern Species.....60
3.2.6 Management Indicator Species 61
3.2.7 Migratory Birds……...68
3.2.8 Public Demand Species.....71
3.3 Social/Economic Environment 73
3.3.1 Economics.....73
3.3.2 Recreation 77
3.3.3 Heritage Resources 79
4.0 LIST OF PREPARERS AND PERSONS CONSULTED 82
4.1 List of Interdisciplinary Team members.....82
4.2 List of Individuals and Organizations Consulted.....82
4.3 References.....86
5.0 APPENDICES..... 91
A. Biological Evaluation.....92
B. Forest Plan Amendment……..143
C. Response to Comments……147
D. Maps……150

List of Figures

Figure 1.1 Location Map 2
Figure 2.1 Alternative 2 Map 10
Figure 2.2 Alternative 3 Map 14
Figure 3.1 Soils Map of AU 23 21
Figure 3.2 Foster Creek Watershed 28
Figure 3.3 Mineral and Special Uses 33
Figure 3.4 1995 & 2002 Southern Pine Beetle Outbreak 44
Figure 3.5 RCW Clusters in the Project Area and Surrounding Vicinity 50

List of Tables

Table 1.1 Summary of Comments Received 04
Table 1.2 Summary of Issues 05
Table 2.1 Proposed actions and treatment acres for Alternative 2 07
Table 2.2 Proposed actions and treatment acres for Alternative 3 11
Table 2.3 Comparison of management actions in each alternative 15
Table 3.1 Soil series and associated soil characteristics and suitability ratings in analysis area 22
Table 3.2 Estimated percent increase in sediment yield due to total future activities within the Foster Creek watershed by alternative 30
Table 3.3 Age class and vegetation type of AU 23 36
Table 3.4 AU 23 late seral stands in Alternative 2 37
Table 3.5 AU 23 late seral stands in Alternative 3 38
Table 3.6 Southern Pine Beetle Hazard Rating 45
Table 3.7 Threatened and Endangered Summary of Conclusions of Effects 46
Table 3.8 Available RCW foraging acreage in project area 49
Table 3.9 Alternative treatments proposed within project area in the designated RCW HMA 51
Table 3.10 Comparison of Restoration/Regeneration allowable in the RCW HMA for AU 23 53
Table 3.11 RCW Guidance needing change to most desired condition 54
Table 3.12 Forest Service Sensitive Species 57
Table 3.13 MIS and represented habitat for AU 23 62
Table 3.14 Common and scientific names of MIS fish 65
Table 3.15 Comparison of the estimated MIS community acreage affected by the proposed actions for each alternative 66
Table 3.16 Payment to Counties, 2007 75
Table 3.17 Economic Efficiency on the forest product revenue generated by alternative 75
Table 3.18 Visual Quality Objective acres in AU 23 78
Table 4.1 List of ID team members 81
Table 4.2 Individuals and organizations consulted 81

1.0 PURPOSE AND NEED FOR ACTION

1.1 Introduction

The Homochitto National Forest is proposing management actions to occur within Analysis Unit 23 (AU 23) to achieve the goals and objectives of the Land and Resource Management Plan (Forest Plan), National Forest of Mississippi. The Homochitto National Forest is located in the southwest corner of the state and is between the cities of Natchez to the west and Brookhaven to the east. The analysis area contains approximately 5,377 acres of National Forest land and approximately 8,062 acres of private land for a total of approximately 13,447 acres. AU 23 is located in T3N R1E, Sections 3; T3N R2E, Sections 3, 4, 5, 6, 7, 8, 9, 10; T4N R1E, Sections 32, 33, 40, 41; and T4N R2E, Sections 34, 35, 36. AU 23 is located in Amite and Wilkinson counties and is part of the Foster Creek subwatershed (Figure 1.1).

Summary of the Proposal

The proposed actions are summarized below:

Thinning would occur on approximately 2374 acres. Thinning would emphasize the reduction of pine density to approximately 60 ft^2/acre within 1st thinning stands; and 70 ft^2/acre within remaining harvested stands. Regeneration by clearcut with reserve would occur on approximately 342 acres. Regeneration by shelter-wood method is prescribed for 440 acres. Regeneration/restocking will be of natural methods except for 342 acres of hand planting in areas designated for longleaf pine restoration. Site prep activities, which consist of mechanical and/or chemical methods and burning, are proposed for the regenerated stands. Release and pre-commercial thinning of stands is proposed for reforested areas. These methods may include chemical, mechanical, and prescribed burning.

Midstory removal is proposed for approximately 118 acres within the project area due to the decreased foraging opportunities for federally endangered red-cockaded woodpecker (RCW). Midstory removal would consist of chemical application and/or mechanical activities. Road maintenance is proposed for approximately 23 miles of Forest Service roads throughout the project area in order to access stands with logging equipment and protect the soil and water resources. Wildlife habitat improvements would consist of constructing ephemeral ponds with bat boxes near these ponds. Additional habitat improvement activities specifically for the RCW include the installation of 84 artificial RCW nest cavities.

Purpose and Need

The purpose for these management actions is to improve the present landscape community to meet the desired conditions of the Forest Plan. The Homochitto National Forest has been identified by the USDI Fish and Wildlife as a secondary core recovery population for the management of RCW. This designation and direction found in the recovery plan for this species also helps determine the desired future condition of the forest. This proposal is designed to improve the conditions of the management of the RCW ecosystem; improve the

overall forest health of the project area; and provide a spectrum of dispersed and developed recreation while supplying sufficient wildlife habitat.

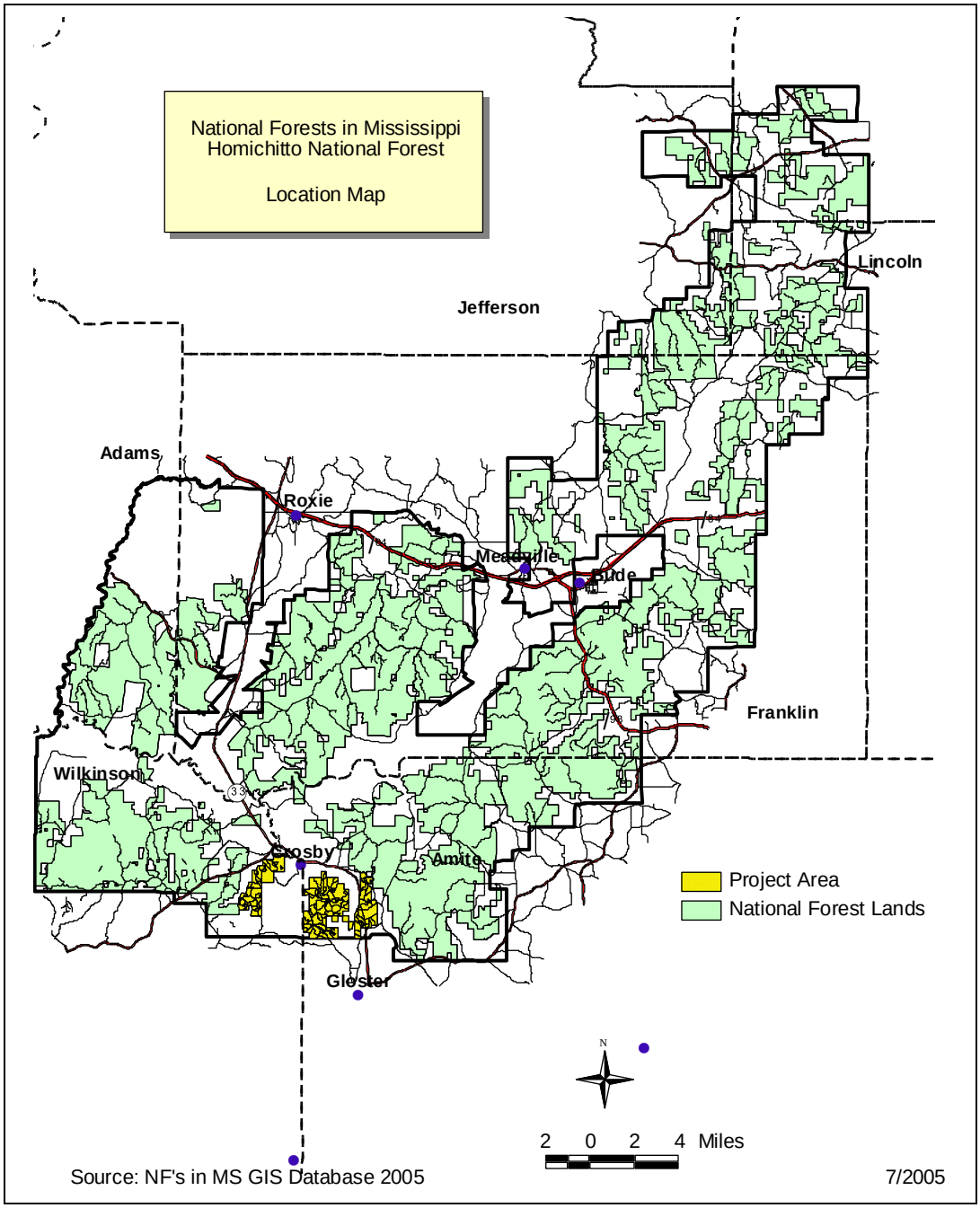

Figure 1.1 Vicinity Map

The desired future conditions of RCW ecosystems are vegetation patterns that are primarily a product of frequent prescribed fire, longleaf pine restoration harvests, and RCW habitat improvement practices producing scattered, moderate openings in an open pine canopy. Restoration focuses on sustaining longleaf pine and its associated ground cover, while restoring areas now dominated by other pine species to longleaf communities over an extended period.

Along with RCW management, the following objectives were developed for this project in order to provide direction and define the goal that the Forest Service is working to accomplish:

- Improvement of forest health through thinning and regeneration of aging stands to increase growth of residual trees and reduce southern pine beetle risk.
- Restoration of fire dependent ecosystem which favors longleaf pine.
- Habitat improvement and reduction of hazardous fuels through the use of prescribed fire.
- Promoting the establishment and growth of hard mast species.
- Help obtain multi-use goals and objectives for long term land and resource management.
- Provide a spectrum of dispersed and developed recreational opportunities.
- Supply sufficient wildlife habitats they may include wildlife openings and ephemeral ponds.
- Providing a relatively high degree of age class and site diversity (community) to increase forest heterogeneity and ecosystem stability – early-, mid-, late seral habitats.

The proposed management actions are needed at this point to improve forest health and to bring the current conditions of the forest closer to the desired conditions of the Homochitto National Forest. Regeneration methods will assist in balancing the age class distribution and providing future habitat that may be suitable for RCW foraging and nesting. Thinning will help in obtaining a healthy forest and developing the desired population objectives. Forests in areas of high densities become suppressed and are more susceptible to beetle infestations, which subsequently deprives RCW of adequate habitat. Thinning in the younger pine stands will assist in maintaining healthy, growing forest and work toward providing more suitable habitat for RCW foraging.

Prescribed burning during site prep activities would reduce woody vegetation competition for the planted seedlings. Herbicide release in the young longleaf stands works toward encouraging the desired future conditions. Competition from noxious and invasive plant species would be decreased with the use of herbicides.

In addition, midstory removal practices, installing RCW inserts in clusters along with thinning and more growing season burns will all aid in providing the desired open park-like conditions and attaining the goal of 254 active clusters on the Homochitto National Forest.

1.2 Documents Incorporated by Reference

The Final Environmental Impact Statement for the National Forest in Mississippi (FEIS) contains the analysis that supports the Forest Plan. The FEIS described the alternatives considered and analyzed the potential environmental effects of implementing the Forest Plan (selective alternatives).

The Forest Plan establishes the desired condition through land management direction. This includes forest-wide management requirements and management area prescriptions with their corresponding directions and standards and guidelines. Specifically, the following standards and guidelines are incorporated by reference from the Forest Plan: Forest-wide management objectives (Forest Plan, p. 4-17 to 4-78); Forest-wide standards and guidelines (Forest Plan, p.

4-2 to 2-17); and Homochitto standards and guidelines (Forest Plan, p. 4-132 to 4-135; 4-147 to4-150).

The environmental assessment (EA) for Analysis Unit 23 presents proposed action and alternatives to meet the desired condition of the Forest Plan. This EA displays the direct, indirect, and cumulative environmental effects of the proposed action and alternatives.

1.3 Decision to be Made

Based on the analysis and description of the Need for Proposed Actions documented in this environmental analysis, the Forest Supervisor, the responsible official, will decide whether to implement the proposed action, implement an alternative action, implement no action, approve an alternative with some modifications, or require development of an environmental impact statement.

1.4 Public Notice and Issues

The public notice process is an early and open process for determining the range of issues to be addressed and for identifying the significant issues related to the proposed action. An issue is an effect of a physical, biological, social, or economic resource. The issues are used to develop alternative management actions and evaluate environmental consequences of such actions. The public notice process is the first step in identifying issues related to the proposed actions. On July 22, 2005 letters describing the proposed actions were mailed to persons, groups, and agencies who have expressed interest in the district management, as well as adjacent landowners to the project area. A legal notice was placed in the Jackson, Mississippi Clarion Ledger on July 27, 2005 describing the proposed actions. The proposal was also listed in the quarterly Schedule of Proposed Action for the National Forests in Mississippi. A list of persons consulted is attached to this EA in Chapter 4.

An Interdisciplinary team (ID Team) reviewed both internal and external comments to identify significant and non-significant issues. Tables 1.1 and 1.2 show the issues derived from this process, their significances to analysis, and unit of measures for significant issues.

Table 1.1 Summary of Comments Received

Comments Received From	Tracking Description
Kearney Foster (Private citizen)	Foster
Internal (ID Team)	USFS
WildLaw (Ray Vaughan)	WildLaw

Table 1.2 Summary of Issues

Preliminary Issues	Group	Source	Clarified Issue Statement	Significant? Yes/NO	Measure
Concern that RCW requirements are not being met	T&E	USFS	Areas designated as RCW recruitment and inactive stands are not currently being managed for RCW	**Yes**.	Number of clusters managed to standard.
Management within potential old growth stands	Vegetation	USFS	RCW management activities could impact potential old growth stands	**No**. Already decided by law or regulation. Potential old growth stands will be assessed per regional direction.	
Protection of a plant species of interest	Vegetation	USFS	Logging and road building can affect the habitat and presence of golden rod which is a species of interest for the forest	**No**. Already decided by law or regulation. Mitigation measures will be carried out to protect the plant species	
Access of stand 18 in compart. 257		USFS	Access to stand 18 is limited, this stand may be a candidate for land exchange	**No**. Candidacy for land exchange is outside scope of project.	
Culvert problem along road 167-A	Roads	USFS	Reconstruction of a blown culvert on 167-A may affect fish passing	**No**. Already decided by law or regulation. Mitigation measures will be carried out to protect resources	
Concern that continuing to use Interim Standards and Guidelines was no longer "Best Science"	T& E	USFS	Best available Science is represented in Current USFWS RCW Recovery Plan	**Yes**	Amendment to Current Forest Plan
Time frame of management actions	Implementation	Foster	Concern that management actions take too long to implement	**No**. Beyond scope of project.	
Lack of longleaf pine restoration analysis	Vegetation	WildLaw	Concern that there are no programmatic NEPA analyses on longleaf pine restoration on the district.	**No**. Beyond scope of project. The decision as to the type of NEPA document will be determined by the analysis of the significant issues.	
Hardwood retention	Vegetation	WildLaw	Concern that this project along with past and future projects will not meet hardwood retention and hardwood area requirements	**No**. Already decided by law or regulation. Covered by standards and guidelines for hardwood management in	

Preliminary Issues	Group	Source	Clarified Issue Statement	Significant? Yes/NO	Measure
				LRMP.	
Outdated Land and Resource Management Plan (LRMP)	Forest Plan	WildLaw	Concern district does not meet national regulations under current LRMP	**No**. Beyond scope of project.	
Publish of new FEIS	FIES	WildLaw	Concern that district has failed to supplement the FEIS prepared for the LRMP	**No**. Beyond scope of project.	
Cumulative Impacts	Cumulative effects	WildLaw	Concern that analysis of impacts/effects of past, present, and future activities are not being carried out (i.e. private land cuts)	**No**. Cumulative effects are analyzed for each project. Private land cuts are analyzed during watershed analysis.	
Site specific MIS /PETS survey	MIS/PETS	WildLaw	Concern that BE and EA will not have full, complete and scientifically defensible population surveys	**No**. Already decided by law or regulation. Data collection will occur as per FS regulation at a level sufficient to provide the responsible official info to make an informed decision	

AU 23 has four records of RCW clusters, none of which have shown signs of being active since at least 1988. There was concern that this unit, situated as it is between two areas of active Red-cockaded woodpecker activity should serve as a corridor for gene exchange between two regions. This would serve to prevent isolation of populations and to encourage re-colonization of AU23.

A larger concern was that due to a combination of factors, best available science was not being utilized in management of red-cockaded woodpeckers in the Homochitto NF. Current management has been done in compliance with the Forest Plan but there is a need to change to the best available science. As a result, the National Forests in Mississippi proposes to update habitat management direction for RCW within the tentative RCW HMA on the Homochitto National Forest by incorporating the latest science and USFWS management strategies adopted in their 2003 Recovery Plan [U.S. Fish and Wildlife Service. 2003. Recovery plan for the red-cockaded woodpecker (*Picoides borealis*): second revision. U. S. Fish and Wildlife Service, Atlanta, GA. 296 pp.] Using best available science for this project will require an amendment (Amendment 19) to the 1985 Land and Resource Management Plan (Forest Plan), replacing the Interim Standards and Guidelines for the Protection and Management of RCW Habitat within ¾ mile of Colony Sites (Interim Standards and Guides) with updated conservation and recovery strategies adopted by the USFWS in their 2003 Recovery Plan for the Red-cockaded Woodpecker, cited above.

2.0 THE ALTERNATIVES CONSIDERED

Alternatives, along with mitigation measures, were developed by the District ID team to meet the purpose and need of the proposed action introduced in Section 1.1 of this document. These alternatives were developed in response to the issues identified during the scoping process.

2.1 Alternative 1 (No Action)

The no-action alternative is required by National Environmental Policy Act and serves as a benchmark for other alternatives in order to show change or effect on the environment. Under Alternative 1, none of the proposed management actions included in the proposed action or other action alternatives would be implemented and the current conditions would be maintained. Activities currently being implemented under previous decisions would continue to occur. Wildfire suppression would only take place at the time of notification of the fire. Actions to suppress southern pine beetle and other insect infestations would only be taken to prevent widespread attack. Actions addressed in other decisions (ex: prescribed burning) may also occur. If a disease or insect infestation occurs, control activities would be developed and analyzed in another document.

2.2 Alternative 2 (Proposed Action)

Alternative 2 is designed to introduce the initial phase of a long-term goal to achieve the desired future conditions of healthy, sustainable forest ecosystems, and management needs of the red-cockaded woodpecker. A description of the proposed treatments under this alternative is given below. Activities proposed as part of this alternative are presented in Table 2.1. The location of these proposed harvesting activities are presented in Figure 2.1. A larger map is provided in Appendix B.

Table 2.1. Proposed actions and treatment acres for Alternative 2

Proposed Actions	Treatment Area
Longleaf restoration clear-cut	342 acres
Shelterwood w/reserves regeneration harvest	440 acres
Crown thinning of pine saplings and poletimber (1st thin)	407 acres
Intermediate thinning in sawtimber stands	1967 acres
Midstory removal	118 acres
Chemical Site preparation	782 acres
Mechanical site prep	782 acres
Site Prep Burning	782 acres
1st year survival checks	782 acres
3rd year survival checks	782 acres
Reforestation (planting)	342 acres
Release of Seedling	782 acres
Pre-commercial thin (year 5-10)	782 acres
Ephemeral ponds	55 ponds
Bat boxes	222 boxes

Proposed Actions	Treatment Area
Install RCW cavities	84 inserts
System road improvement	23 miles
Temporary road reconstruction	5.5 miles
Late seral designation	452 acres

Longleaf restoration clear-cut with reserves is proposed for approximately 342 acres of loblolly pine forest. The average age of the stands is 94 years, and contains approximately 10 BA/acre of longleaf pine, which would be left to assist in the restoration of longleaf pine species on the stand site. Shelterwood cut with reserves is proposed for 440 acres to regenerate a portion of the analysis area and to improve the age class distribution. **Site preparatory** work within regeneration sites would consist of mechanical and herbicide treatments followed by a prescribe burn. Follow-up treatments would include **release** of the seedlings from competition and/or **pre-commercial thinning** using prescribed burning (also a preventative treatment for brownspot needle blight), herbicide, and /or mechanical treatments. **Site prep burns** are proposed for 782 acres of regeneration within AU-23. **Planting of longleaf pine** is proposed for the 342 acres proposed for restoration clear-cut.

Crown thinning (1st thin) is proposed for approximately 407 acres of pine stands with an average age of 17 years. The proposed thinning harvest will decrease competition between trees and will release trees for improved growth. Thinning will also reduce the susceptibility to infestations from insects and disease, and move closer to providing adequate future foraging habitat for the RCW. An additional 1018 acres within the project area are proposed for thinning within the 2005 First Thinning Project. The effects of this project may be found in its related documents, however, these areas were considered in the evaluation of cumulative effects for AU 23.

The **intermediate thinning** is proposed for approximately 1967 acres of pine and pine hardwood stands ages 34-100 years. These stands do not meet the required management of RCW's, which favors low BA/acre of mature pine, with little or no hardwood-pine midstory. Thinning at this time would maximize the potential for RCW introduction and survival in clusters and rehabilitation in other stands.

Midstory removal is proposed for approximately 118 acres within the project area to mitigate the decreased foraging and nesting opportunities for RCW due to the presence of hardwood midstory. Midstory removal would consist of chemical application and/or mechanical activities.

Wildlife habitat improvements would consist of constructing ephemeral ponds with bat boxes near these ponds and the mowing of roads closed after harvest to provide ideal conditions for desirable grassy and herbaceous browse. Ephemeral ponds are found in a variety of positions on the landscape, but to maximize wildlife benefits, ponds may be built adjacent to old logging roads, gated roads, small openings, or log landings. Ephemeral ponds can be spaced fairly close together, a maximum of one every 100 acres, however, these pools should be no larger than 1/10 of an acre to considerably less. Ephemeral ponds should be no

deeper than 3 feet and have gently sloping sides. Soil needs to have adequate clay content to hold water. Three to five bat boxes will be placed at ephemeral ponds. These ponds provide optimal feeding habitat for bats and also provide a water source. Bat houses will provide additional roosting sites in areas that are lacking this type of habitat. Additional habitat improvement activities, specifically for the RCW includes the installation of 84 artificial RCW nest cavities.

System road improvements are proposed for approximately 23 miles of Forest Service roads throughout the project area in order to access stands with logging equipment and protect the soil and water resources. Approximately 5.5 miles of **temporary road construction** will be needed during harvesting operations. Erosion control activities would be implemented to stabilize exposed soil on skid trails, landings, and temporary roads used during harvesting activities after the completion of the harvest.

The goal of the National Forests in Mississippi is to have a minimum of 2.5% of the suitable land base to be considered as **late seral** (Forest Plan, p. 4-6). Late seral stands are areas set aside for large size trees, 18”-26” dbh. Approximately 452 acres are designated late seral in Alternative 2.

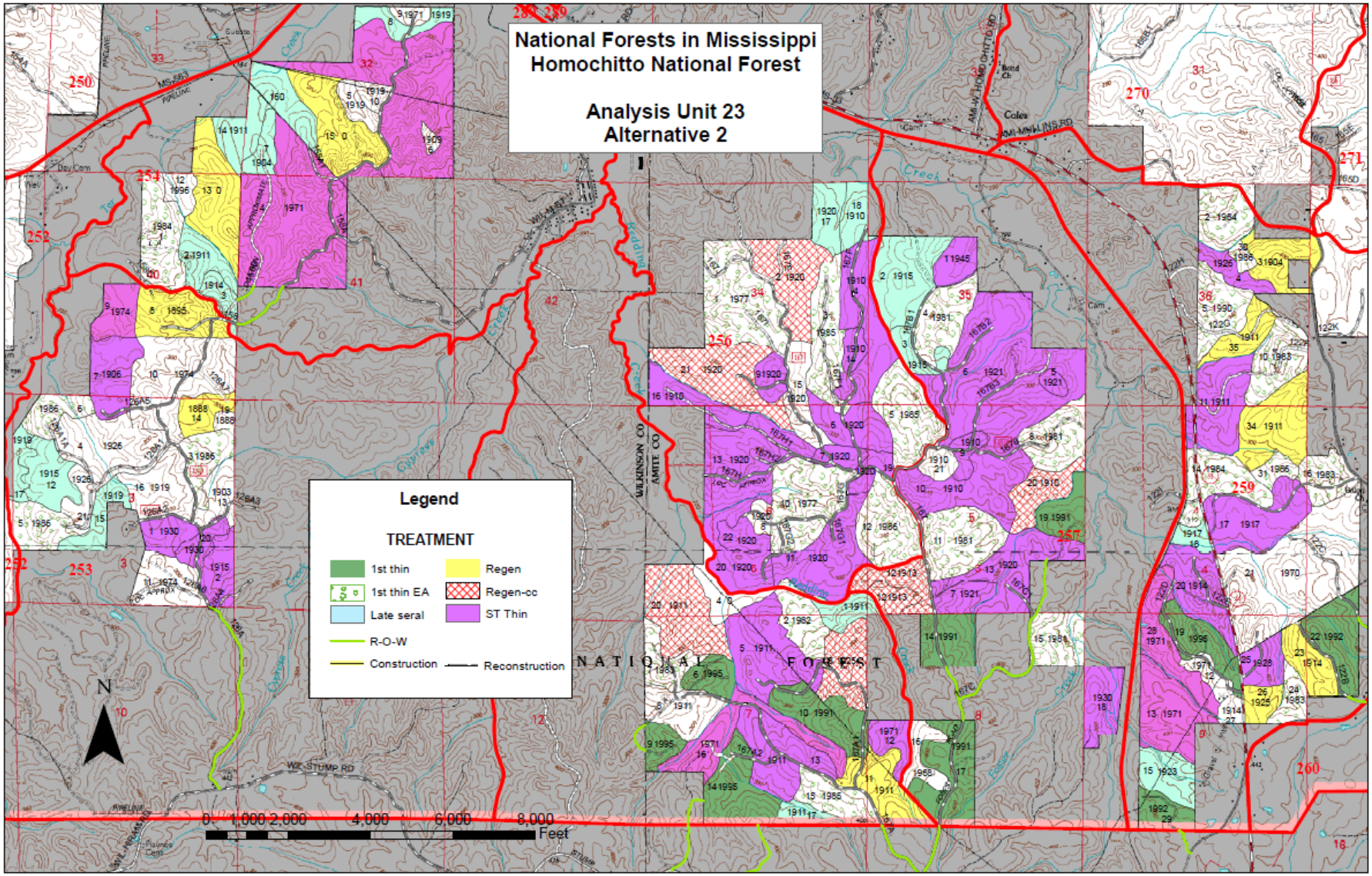

Figure 2.1 Alternative 2

2.3 Alternative 3

Alternative 3 was developed in response to concerns that more accelerated management utilizing best available science was necessary to return the red-cockaded woodpecker to the project area. This alternative will meet the goals and objectives of the Forest Plan, but will require an amendment to the current Forest Plan in order to meet the direction of the *Recovery Plan for the Red-cockaded Woodpecker (Picoides borealis): Second Edition (Recovery Plan)* issued by the USDI Fish and Wildlife Service (USFWS), Southeast Region. These changes will provide management direction for the remainder of the current Plan period, or until modified by a subsequent amendment or revision. The proposed actions have been modified in order to maximize RCW foraging habitat.

In June of 1995 the National Forests in Mississippi Forest Plan was amended (Amendment #14) to incorporate The Interim Standards and Guidelines for the Protection and Management of RCW Habitat within ¾ mile of Colony Sites and designate tentative Habitat Management Areas (HMAs) for suitable RCW habitat. These interim guidelines were developed consistent with the first revision of the RCW Recovery Plan approved on April 11, 1985. The USFWS approved a second revision of the RCW Recovery on January 27, 2003, prompting the need to modify the original interim guidance to conform to revised RCW habitat management guidance in the 2003 RCW Recovery Plan.

The Interim Standards and Guidelines for the Protection and Management of RCW Habitat within ¾ mile of Colony Sites no longer reflect the latest science regarding RCW habitat management and species recovery. The USFWS 2003 RCW Recovery Plan outlines the actions, to the best current understanding, that are necessary to recover red-cockaded woodpeckers. Implementation is accomplished through incorporation of management guidelines identified in the Recovery Plan Revision into agency decision documents. This alternative, presents our first opportunity to incorporate this revised direction on the Homochitto National Forest.

A description of the proposed treatments under this alternative is given below. Activities proposed as part of this alternative are presented in Table 2.2. The location of these proposed harvesting activities are presented in Figure 2.2. A larger map is provided in Appendix B.

Table 2.2. Proposed actions and treatment acres for Alternative 3

Proposed Actions	Treatment Area
Longleaf restoration clear-cut,	396 acres
Shelterwood w/reserves regeneration harvest	174 acres
Crown thinning of pine saplings and poletimeber (1st thin)	560 acres
Intermediate thinning in sawtimber stands	1341 acres
Midstory removal	1332 acres
Chemical Site preparation	570 acres
Mechanical site prep	570 acres

Proposed Actions	Treatment Area
Site Prep Burning	570 acres
1st year survival checks	570 acres
3rd year survival checks	570 acres
Reforestation (planting)	396 acres
Release of Seedling	570 acres
Pre-commercial (year 5-10)	570 acres
Ephemeral ponds	55 ponds
Bat boxes	222 boxes
Install RCW cavities	84 inserts
System road improvement	20.2 miles
Road construction	1.2 miles
Temporary road reconstruction	5 miles
Late seral designation	441 acres

Longleaf restoration clear-cut is proposed for approximately 396 acres of loblolly pine forest. The average age of the stands is 94 years. Shelterwood cut with reserves is proposed for 174 acres to regenerate a portion of the analysis area and to improve the age class distribution. **Site preparatory** work in regeneration sites would consist of using mechanical/herbicides followed by a prescribe burn. Follow-up treatments would include **release** and/or **pre-commercial thinning** of the seedlings from competition using prescribed burning (also a preventative treatment for brownspot), herbicide, and /or mechanical treatments. **Site prep burns** are proposed for 570 acres of regeneration within AU-23. **Planting of longleaf pine** is proposed for the 396 acres proposed for restoration clear-cut.

Crown thinning (1st thin) is proposed for approximately 560 acres of pine stands with an average age of 17 years. The proposed thinning harvest will decrease competition between trees and will release trees for improved growth. Thinning will also reduce the susceptibility of the stands to infestations from insects and disease, and move the stands closer to providing adequate future foraging habitat for the RCW. An additional 1018 acres within the project area are proposed for thinning within the 2005 First Thinning Project. The effects of this project may be found in its related documents.

The **intermediate thinning** is proposed for approximately 1341 acres of pine and pine hardwood. The stands have high stocking densities. These stands also do not meet the required management of RCW, which favors low BA/acre of mature pine, with little or no hardwood-pine midstory. Thinning at this time would maximize the potential for RCW introduction and survival in clusters and rehabilitation in other stands.

Midstory removal is proposed for approximately 1332 acres within the project area to improve foraging opportunities for RCW due to the increased presence of hardwoods. Midstory removal would consist of chemical application and/or mechanical activities.

Wildlife habitat improvements would consist of constructing ephemeral ponds, placing bat boxes near these ponds and the mowing of roads closed after harvest to control undesirable woody species, and maintain access. Ephemeral ponds are found in a variety of positions on the landscape, but to maximize wildlife benefits, ponds may be built adjacent to old logging roads, gated roads, small openings, or log landings. Ephemeral ponds can be spaced fairly close together (a maximum of one every 100 acres) but should be no larger than 1/10 of an acre to considerably less. Ephemeral ponds should be no deeper than 3 feet and have gently sloping sides. Soil needs to have adequate clay content to hold water. Three to five bat boxes will be placed at each ephemeral pond. These ponds provide optimal feeding habitat for bats and also provide a water source. Bat houses will provide additional roosting sites in areas that are lacking this type of habitat. Additional habitat improvement activities, specifically for the RCW includes the installation of 84 artificial RCW nest cavities.

System road improvements are proposed for approximately 21.4 miles of Forest Service roads throughout the project area in order to access stands with logging equipment and protect the soil and water resources. Approximately 5 miles of **temporary road construction** will be needed in during harvesting operations. Erosion control activities would be implemented to stabilize exposed soil on skid trails, landings, and temporary roads used during harvesting activities after the completion of the harvest.

The goal of the National Forests in Mississippi is to have minimum of 2.5% of the suitable land base in each compartment to be considered as **late seral** (Forest Plan, p. 4-6). Late seral stands are areas set aside for large size trees, 18”-26” dbh. Approximately 441 acres are designated late seral in Alternative 3.

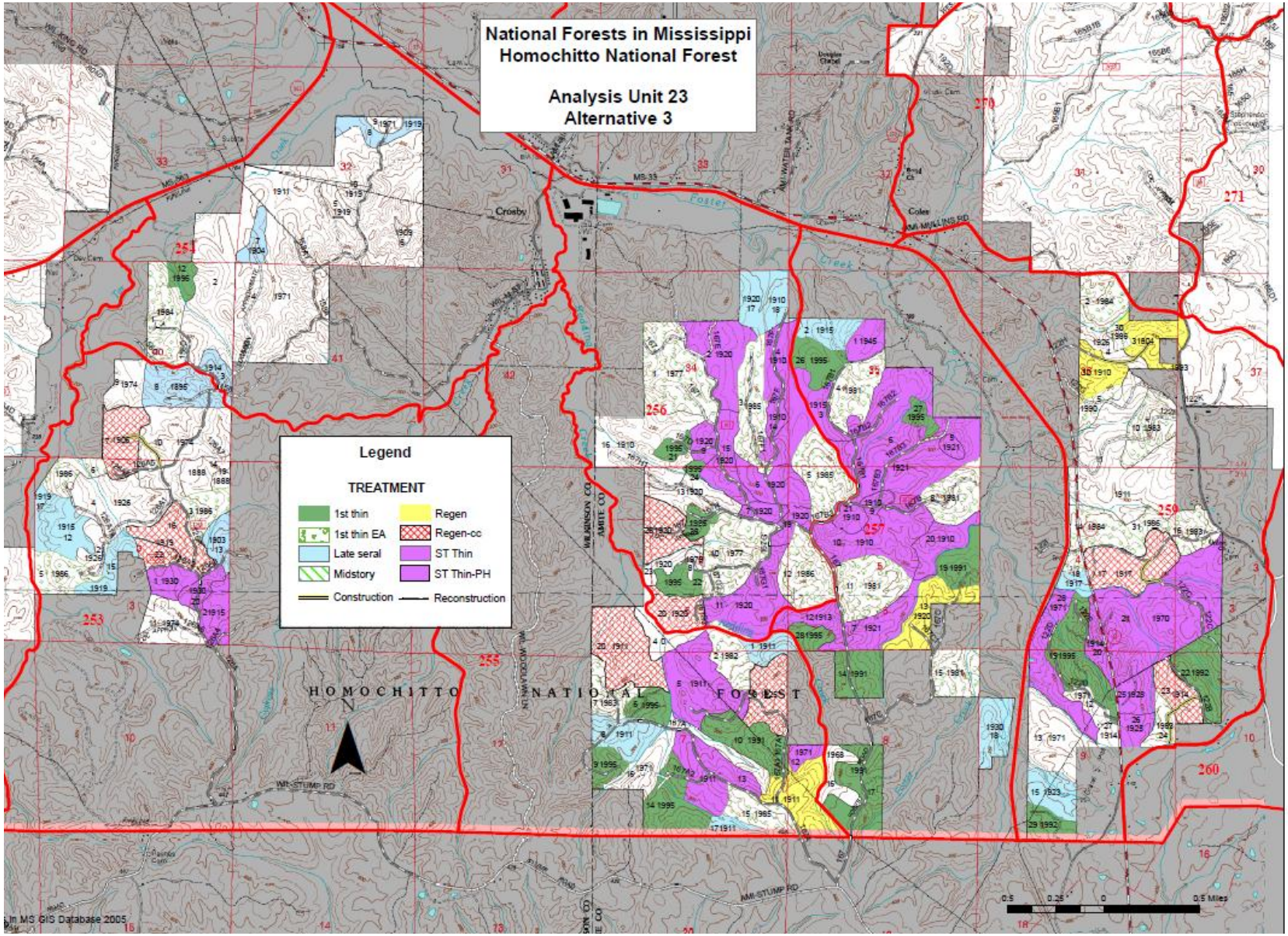

Figure 2.2 Alternative 3

2.4 Alternatives Considered But Not Addressed In Detail

Alternative 4 (natural regeneration of longleaf pine)

An alternative to use natural methods of regeneration of longleaf pine was considered instead planting longleaf seedlings to meet resource objectives. Due to the lack of available longleaf seed sources this alternative was not deemed feasible. With the presence of the dominant loblolly pine species, attempting to establish longleaf in the regeneration areas would result in failure and not meet the goals and objectives of the Forest Plan, or the improvement of habitat for the RCW.

Alternative 5 (No Herbicide Treatment)

An alternative was considered to not use herbicides within this analysis unit as a means to control vegetation. One of the primary goals of using herbicide is to decrease the amount of competition to young tree seedlings. Without herbicides, extensive amounts of manpower would need to be used to create a similar effect. It is questionable if the desired results can be achieved without the use of herbicides. This alternative was considered but not analyzed in detail because it doesn't support the desired future condition for the area.

2.5 Comparison of Alternatives

An overview of the differences among the alternatives considered in detail is provided in Table 2.3.

Table 2.3. Comparison of management actions in each alternative.

Proposed Activity	No-Action	Alternative 2	Alternative 3
Project Area	5377 acres	5377 acres	5377 acres
Thinning: First Intermediate	1018 acres* 0 acres	407 acres 1967 acres	560 acres 1341 acres
Longleaf Restoration cut	0 acres	342 acres	396 acres
Shelterwood Method	0 acres	440 acres	174 acres
Site Prep. – Herbicide/Burn	0 acres	782 acres	570 acres
Planting Longleaf	0 acres	342 acres	396 acres
Release	0 acres	782 acres	570 acres
Pre-commercial Thin	0 acres	782 acres	570 acres
RCW Midstory Work	0 acres	118 acres	1332 acres
Ephemeral pond construction	0 ponds	55 ponds	55 ponds
Bat boxes	0 boxes	222 boxes	222 boxes
RCW cavity inserts	0 Inserts	84 Inserts	84 inserts
System road improvement	0 miles	23 miles	20.2 miles

Proposed Activity	No-Action	Alternative 2	Alternative 3
System road construction	0 miles	0 miles	1.2 miles
Temporary road construction	0 miles	5.5 miles	5 miles
Late seral designation	231 acres	452 acres	441 acres
0-10 age class	0 acres	782 acres; 14%	570 acres; 11%
Consistent with Forest Plan	Yes	Yes	No
Extent to which RCW recovery is provided	Low	Medium	High

* -acres covered within FY 2005 First Thin Project

2.6 Protective Measures

Protective measures are actions taken to avoid, minimize, reduce, or eliminate adverse affects of implementing the proposed action or alternative action. The Forest Plan's management requirements and standards and guidelines are incorporated into design of the proposal and alternatives as protective measures (Forest Plan, 4-2 through 4-17). These include the Forest-wide standard and guidelines for all management areas on the Homochitto National Forest.

Streams

Streamside filter strips will be managed primarily to maintain water quality. A filter strip shall be designated adjacent to all streams, with perennial and intermittent streams designated as protected during timber sale contracts. (Forest Plan, M-1)

Filter strips shall be a minimum of one chain (66 feet) in width. (Forest Plan, M-2)

Within the filter strip zone, which shall be called a streamside management zone (SMZ), prohibit the following practices near perennial and intermittent streams (Forest Plan, M-2 through M-4):

- Felling of trees in stream (except as necessary for fisheries management)
- Slash in stream
- Rutting
- Mechanical equipment within one-half chain of stream bank except at necessary designated crossing
- Log landings
- Roads, except at necessary designated crossings

- Exposure of more than 10% of mineral soil within one-half chain of stream bank
- Prescribed burning
- Minerals development

Soil and Water

As a minimum the state of Mississippi's best management practices (BMP's) will be applied to protect water quality. (Forest Plan, 4-11)

In site preparation operations, the maximum amount possible of litter will be retained in surface raking and pushing operation. No root raking will occur. This should maintain present soil productivity. (Forest Plan, 4-11)

Restrict mechanical equipment on slopes greater than 20% during site preparation operations. (Forest Plan, 4-11)

Heritage

Survey for, and maintain an inventory of, cultural resources on National Forest land, both in advance of ground disturbing activities and in general. Evaluate sites in areas of impact to determine the need for preservation. Protect sites on or eligible for the National Register of Historic Places, or significant in other ways. Enhance sites suitable in an interpretive setting (Forest Plan, 4-5)

Operations and Maintenance

Construct/reconstruct only roads identified in the transportation analysis as being necessary to meet resource objectives. (Forest Plan, 4-14)

Roads identified as no longer needed for resource management objectives will be obliterated and returned to meet resource production. (Forest Plan, 4-14)

Vegetation Management

The maximum size of stand openings to be created by regeneration cutting in one operation is 80 acres for southern pines and 40 acres for all other species. These regeneration cuts shall be separated from each other by a minimum distance of five chains (330 feet) and should normally be a minimum of three chains wide (198 feet). (Forest Plan, 4-9)

Provide a late seral component consisting of large size trees (18"-26" DBH). (Forest Plan, 4-6)

Threatened, endangered, sensitive, and other rare plant species

Avoid disturbance to sensitive plant populations and occupied habitat. Include project-level protective measures in individual projects, which may impact known rare plant populations. Avoid mechanical disturbance to rare listed plant sites, especially during the growing season.

RCW Habitat-Current Direction

Provide for the following in stands where trees are equal to or greater than 10 inches diameter at breast height (DBH): (RCW EIS)

- Maintain pine BA of 60-110 square feet, depending on site and stand location.
- Use the following priority to select pine trees to retain:
    - Relict trees
    - Other potential cavity trees
    - Trees greater than 10 inches DBH that are not potential cavity trees
    - Trees less than 10 inches DBH

RCW Habitat - Proposed Forest Plan Amendment Direction

In systems of medium to high site productivity (site index 60 or more, for the dominant pine species), provide each group of woodpeckers 120 ac of good quality foraging habitat as defined below: (RCW Recovery Plan)

- 18 or more stems/ac of pines that are $\geq$ 60 years in age and $\geq$ 14 inch dbh. Minimum basal area for these pines is 20 ft^2/ac.

- Basal area of pines 10-14 inch dbh is between 0 and 40 ft^2/ac.

- Basal area of pines < 10 inch dbh is below 10 ft^2/ac and below 20 stems/ac

- Basal area of all pines $\geq$ 10 inch dbh is at least 40 ft^2/ac.

- Groundcovers of native bunchgrasses and/or other native, fire-tolerant, fire dependent herbs total 40 percent or more ground and midstory plants and are dense enough to carry growing season fire at least once every 5 years.

- No hardwood midstory exists, or if a hardwood midstory is present it is sparse and less than 7 ft in height.

- All this habitat is within 0.5 miles of the center of the cluster, and preferably, 50 percent or more is within 0.25 miles of the cluster center.

- Foraging habitat is not separated by more than 200 ft of non-foraging habitat.

2.7 Monitoring

The monitoring and evaluation of any alternative selected for implementation will be according to the following monitoring requirements and others contained in the Forest Plan (pages 5-2 through 5-13).

- All contract activities will be monitored by Forest Service personnel to ensure that management requirements are implemented properly.

After treatments, Forest Service personnel will determine if activities were correctly implemented and desired results achieved. Based on this evaluation, any need for additional actions may be recommended.

3.0 AFFECTED ENVIRONMENT and ENVIRONMENTAL CONSEQUENCES

This Environmental Assessment was developed considering the best available science in accordance with 36 CFR 219.36 (a) and is consistent with the provisions of the National Forests in Mississippi Forest Plan, as amended. Chapter 3 is organized by resource and provides a discussion of relevant resource components of the existing environment (Affected Environment) – that is the base line environment. This section also describes the probable consequences (Environmental Consequences) to each environmental resource from the proposed activities.

3.1 Physical Environment

3.1.1 Soils

Affected Environment

The Homochitto National Forest lies in the thick loess and thin loess Major Land Resource Area of the Southern Mississippi Valley Silty Uplands (USDA Natural Resource Conservation Service 2005). Soils were derived from coastal plain sands and clays, and floodplains with alluvium of mixed coastal plain and loessial origin. Soils within the boundaries of the proposed project formed in residuum of stratified marine sediments of sand, gravel, and clay. Ridge tops and upper side slope landforms have a mantle of loess ranging in thickness of 3-8 feet.

An extensive soil resource inventory for the Homochitto National Forest was completed in 1984 (*Soil Resource Inventory Report*, Homochitto National Forest, 1984). This survey identified the different soil types and associated soil map units along with their locations. Important characteristics of these soil types along with the implications for management were also presented as part of this report. The interpretation of the soil map units provides the limitations and capabilities of the soils to anticipated impacts related to management.

The nine specific soil series that occur within the analysis area have been described in the *Soil Resource Inventory Report*. These series include: Ariel Silt Loam, Bude Silt Loam, Gillsburg Silt Loam, Lorman Silt Loam 8-20%, Lorman Silt Loam 20-40% slope, Providence Silt Loam Eroded 0-8% slope, Smithdale Sandy Loam 20-45% slope, Saffell Gravelly Fine Sandy Loam, and Pits, Udorthents Complex. A map of the soils in the project area is shown below in Figure 3.1, and the soil characteristics and suitability ratings are shown in Table 3.1 below.

The ratings in Table 3.1 do not indicate the ability to implement project activities. These ratings help to indicate the relative amount of mitigation needed to protect the soil resource and to successfully implement a chosen activity. The soil ratings are taken into account in the planning phase to identify the required mitigation measures. Examples of mitigation measures are shown in section **2.6 Protective Measures**, of this document.

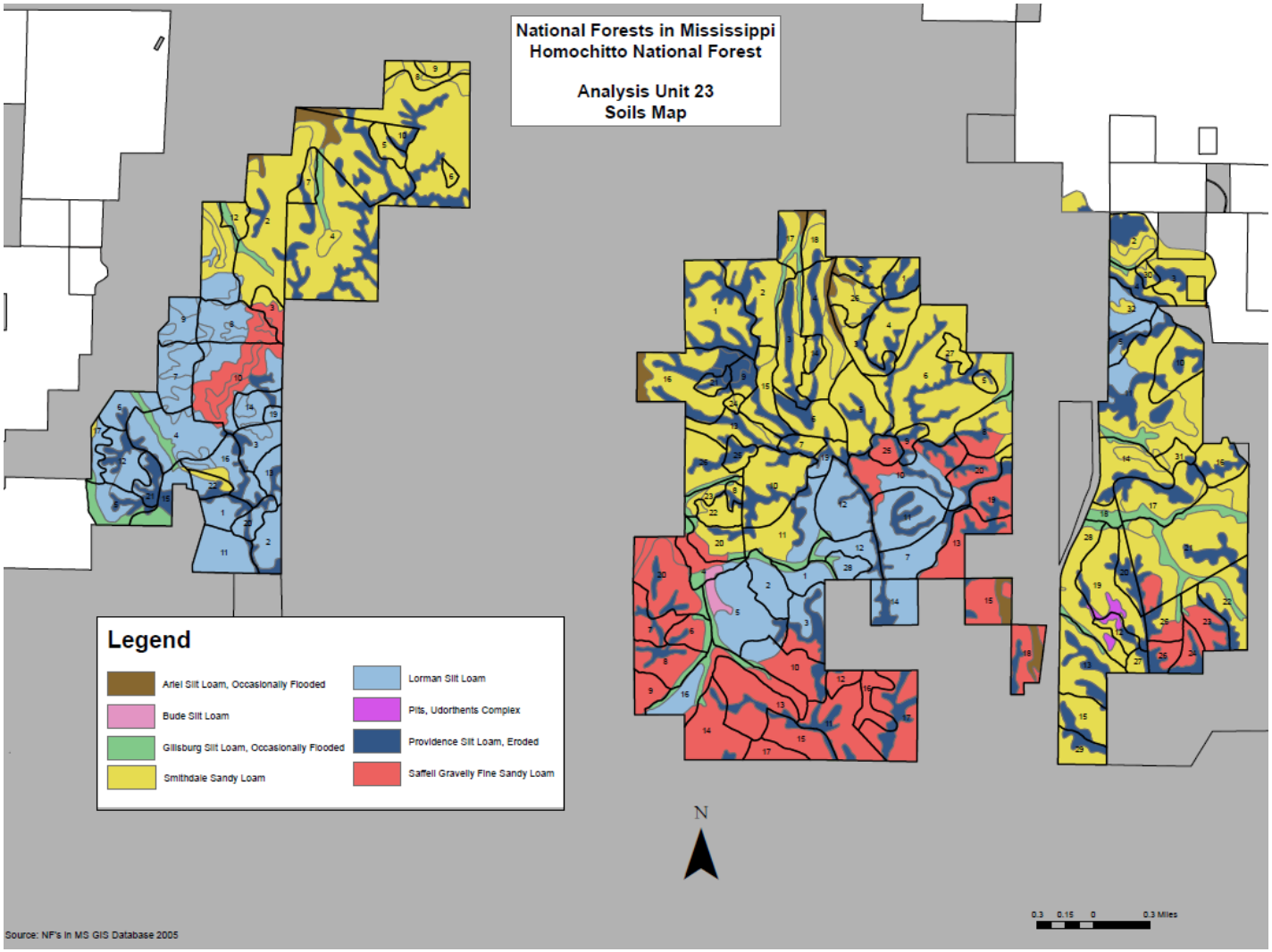

Figure 3.1. Soils Map for AU 23.

Table 3.1. Soil series and associated soil characteristics and suitability ratings in the analysis area.

Soil Series	Slope (%) / Acres	Compaction Hazard Rating	Flood Hazard / Rutting Hazard	Drainage	Erosion Hazard Rating	Soil Limiting Characteristics	Suitability for Access Roads	Suitability for Harvest Equipment
Ariel silt loam	0-2 / 67	Severe	Severe/ Severe	Well Drained	Slight	6 month operating season	Poor	Moderate
Bude silt loam	0-2 / 11	Severe	Moderate/ Severe	Poorly Drained	Slight	6 month operating season	Fair	Moderate
Gillsburg silt loam	0-2 / 225	Severe	Severe/ Severe	Poorly Drained	Slight	3-6 month operating season	Poor	Moderate
Lorman silt loam	8-20 / 104	Severe	None/ Severe	Moderate Drained	Moderate	Mod. Compaction, erosion, rutting	Poor	Severe
Lorman silt loam	20-40 / 905	Severe	None/ Severe	Moderate Drained	Severe	Severe rutting	Very Poor	Severe
Providence silt loam	0-8 / 989	Severe	None/ Severe	Moderate Drained	Moderate	Seasonal Wetness	Fair	Moderate
Pits, Udorthents Complex*	0-8 / 11	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Saffell gravelly fine sandy loam	20-45 / 850	Moderate	None/ Moderate	Well Drained	Severe	Severe Steepness	Poor	Severe
Smithdale sandy loam	8-20 / 252	Moderate	None/ Moderate	Well Drained	Moderate	Mod. Compaction, rutting	Poor	Slight
Smithdale sandy loam	20-45 / 1989	Severe	None/ Moderate	Well Drained	Severe	Spring heads are common	Poor	Severe

 # No data for Pits Udorthents Complex

Alternative 1-No Action

Direct/Indirect effects- Under this alternative, current condition within the project area will persist. Effects would only be those related to the existing condition, such as existing system roads and prescribed burns. Dense tree populations could lead to a deteriorated state in the overall health of the project area. High levels of fuels, in the form of thick vegetation, could lead to catastrophic wildfire.

Cumulative effects- There have only been prescribed burn treatments in this AU during the past three years. Approximately 1018 acres of first thinning treatments are proposed for treatment within another decision. Soil productivity could be adversely impacted through compaction, erosion, and nutrient leaching and/or displacement when thinning activities occur. To minimize the impacts of first thinning operations, the tops and slash are typically pulled back over skid trails to create a mat for logging equipment to drive on, minimizing soil compaction and rutting. Some nutrients would be lost due to timber removal, but over time most nutrients would be added back into the soil from the slash that is left on the ground after harvesting is completed. Preliminary results from the *Long Term Soil Productivity Study* currently being conducted by the Southern Forest Experiment Station on the National Forest in Mississippi indicate soil productivity is maintained when slash is retained on site (Conner 2004). The practice of spreading limbs back over the site, especially on skid trails and other disturbed areas would reduce adverse impacts to soil productivity.

Alternative 2- Proposed Action

Direct/indirect effects- Timber harvesting along with release and midstory work can increase total watershed yields, storm peak flows, erosion, and sedimentation without mitigation measures to protect soil loss. The reduction of vegetation and duff makes the underlying soils more susceptible to compaction and erosion. Soil productivity could be adversely impacted through compaction, erosion, and nutrient leaching and/or displacement when harvesting activities occur. Monitoring soils subsequent to any harvesting treatment will determine whether erosion/sedimentation mitigation is needed. Chapter 4 (pages 4-12 and 4-13) of the FEIS for the National Forests in Mississippi LRMP states the many possible impacts to soil health and productivity related to harvesting activities.

Concerns regarding the impacts of harvesting activities on soil compaction are important due the fact that most soils within the project area have a compaction hazard rating of severe. Heavy equipment may compact soils, decreasing infiltration and percolation rates and increases runoff (Lewis 1998). To minimize soil compaction and erosion best management practices will be implemented over the duration of the project activities. Restricting activities during the wet season (November 30 through March 1) would minimize compaction. Logging activities conducted during moist soil periods may produce severe rutting, temporary destruction of soil structure, decreased permeability, and greater resistance to root penetration. Tree and plant growth could be

reduced and run-off could increase if harvesting is done during wet season. Recovery of severely compacted soils could range from 5 to 40 years (Croke et. al, 2001). Erosion may be reduced by reseeding disturbed and exposed areas upon completion of the project activities. Correct layout and design of the timber sale and harvest areas will also be important to minimize any adverse impacts.

Forest roads are essential for forest management, such as thinning and timber harvest, as wells as providing recreational access (Foltz et al, 2007). Timber activities demand low standard roads for gaining access to harvest areas and for hauling logs from sites. Road construction/reconstruction will only be done on roads identified in the transportation analysis as being need to meet resource objectives (Plan, pg. 4-14). Up to 90% of sediment produced from forested lands comes from roads (Grace et. al, 1998). The erosion and sediment associated with roads can be mitigated but not totally eliminated, however, road construction/reconstruction would occur on stable soil types and the effects would be limited by the use of mitigation measures such as adequate cross-drainage, wing ditches, seeding of exposed areas, and placement of protective surface material on the exposed roadbed. Furthermore, use would be limited to dry weather hauling to prevent excessive rutting and erosion.

Site prep activities consisting of burning, chemical and/or mechanical treatments can increase erodibility by creating bare ground, and hot burns can delay re-vegetation by killing sprouting vegetation. Burning could also accelerate re-vegetation by releasing or scarifying seeds. All possible best management practices would be implemented over the duration of the site prep activities to ensure the least possible adverse impacts.

In 2000, soil monitoring was done on 6 thinning units and 2 regeneration units on the Homochitto National Forest. Soil traps were used and it was found that no trap measured soil greater than or equal to the tolerable soil loss per acre that would affect soil productivity. Most of the sediment traps showed no sign of sediment-laden surface water. Sediment traps located in filter strips illustrated that filter strips were effective in filtering surface water sediment to meet water quality goals. Monitoring took place over 11 months: in this time no site had more than .06 tons/acre of sediment movement (USDA Forest Service 2000).

Predicted erosion rates have been calculated for the project area. These predicted rates do not directly translate to sediment in a stream, because a good portion of eroded soil is deposited on the slope before reaching the channel (Dissmeyer and Stump 1978). The National Forests in Mississippi LRMP (1985b) identifies acceptable management activities on the most easily eroded (benchmarks) soils on the Forest and their predicted erosion rates. A forested T-Factor is used for each soil to determine the tolerable soil loss rate. For the analysis area, Smithdale sandy loam soils are moderately erosive and a benchmark soil. The forested T-Factor for a Smithdale sandy loam soil is .8; using an 80 year rotation, this means that 64 tons/acre/80 years is the total allowable soil loss that can occur. The predicted erosion over an 80 year period for a Smithdale sandy loam soil on the Homochitto with the following activities taking place: burning, thinning, logging, and disc; is 8.9 tons/acre. This is well under the allowable erosion of

64 tons/acre/80 year rotation. Since the Smithdale sandy loam soil is the most abundant soil within the analysis area and potentially the most adversely affected by poor management, an assumption is made that if good management is applied uniformly, and thereby protects the most sensitive soils, then all other less sensitive soils will also be protected.

Herbicide treatments would consist only of herbicides that have Human Health and Ecological Risk Assessments prepared. Site preparation and release with herbicides will introduce slightly toxic chemicals to the site. These herbicides may accumulate to a slight degree within the soil for five days to six months and translocate to nontarget vegetation.

Triclopyr has little or no soil activity. Triclopyr degrades rapidly in the soil mostly by photodecomposition but also by microbes. Its average half-life in the soil is 40 to 46 days (SERA 2003). Triclopyr has low leaching characteristics though leaching depends on soil pH and organic matter; more leaching occurring in light soil and heavy rainfall. Triclopyr has a half-life in water of 10 hours at 77 degrees F. Herbicides do not disturb soil, so treated areas usually have intact litter and duff that eliminate or at least minimize erosion. The affect to soil biota is negligible at typical rates.

Imazapyr has relatively low soil mobility. Imazapyr appears to bind loosely to clay particles and organic matter. Soil activity expresses itself during the period of spring leaf expansion. Applications made from late June through mid-September produce little or no evidence of soil activity. Applications after mid-September may yield soil activity during the following spring. Application would be expected during the summer, which would minimize soil activity. The half-life of imazapyr is reported to be 25-180 days, highly depending on microbial populations (SERA 2004).

Glyphosate is not soil active. It is strongly absorbed to soil particles and organic matter and deactivates rapidly by muddy water or water with high calcium content. Glyphosate is a growth inhibitor that is absorbed by foliage and translocates throughout the plant, eventually accumulating in the roots. The half-life of glyphosate ranges from 3 to 96 days (SERA 2003).

Hexazinone is a soil active herbicide. It is a systemic herbicide that works by inhibiting photosynthesis in the target plants (EXTONET 1993). Rainfall or irrigation water is needed before it becomes activated. The half-life of hexazinone can range from 5 to 200 days depending on the climate and soil type (SERA 2005). Hexazinone is broken down by soil microbes and photodegradation.

Sulfometuron-methyl is of low to moderate persistence in the soil environment. It is broken down in soil by the action of microorganisms, by hydrolysis, and through photodegradation. Reported half-lives of sulfometuron-methyl range from 10 to 100 days depending on soil type (SERA 2004). Sulfometuron-methyl does not bind strongly to soil and is slightly soluble in water, but is rapidly degraded and does not appear to pose a threat to groundwater.

Due to type of application, little soil activity, rapid degradation, low rate of application, and mitigation measures, no adverse effect would be expected to soil or water from the use of herbicides proposed in the action alternatives.

Detailed risk assessments, including surface and subsurface off-site movements, may be found at http://www.fs.fed.us/foresthealth/pesticide/risk.shtml. Analysis of these risk assessments reveals little, if any negative effect on soil or water quality from the use of these pesticides and methods. Animal and human health risks for these products are very low.

Cumulative effects- Implementation of Best Management Practices, standard mitigation, natural means, and monitoring by Forest Service officials would result in minimal soil effects for this alternative. The predicted erosion rate for the dominant soil type was within tolerable limits of maintaining site productivity in the short and long term. The cumulative effects of all management actions over time are not expected to reduce soil productivity. Mitigation measures for past, present and reasonably foreseeable management activities are designed to keep the organic litter layer or replace that layer by seeding and fertilization; therefore, impacts associated with any one treatment would be completely recovered within three years.

Alternative 3

Direct/indirect effect- Implementation of this alternative would be similar to those discussed under Alternative 2. Elimination of some proposed regeneration and thinning units would reduce the possibility of additional erosion or compaction. Midstory work would have similar effects as thinning and release work, but would be minimized with proper protective measures.

Under the proposed plan amendment, temporary loss of groundcover as a result of more frequent prescribed burning for RCW habitat improvement (1 to 5 year burning rotation within HMAs) may increase the risk of erosion on some sites burned, especially steeper slopes. On most Lower and Middle Coastal plain sites there is little danger of erosion (USDA 1989).

Cumulative effects- Effects of this alternative would be similar to those in Alternative 2. There would be no additional cumulative effects to the soil with the implementation of Alternative 3 with the proposed plan amendment.

3.1.2 Water

Affected Environment

Analysis Unit 23 lies within the 6th level watershed of Foster Creek. This 6th level watershed resides inside the 5th level watershed of the Middle Homochitto River. The

location of the Foster Creek watershed is shown in Figure 3.2. Water bodies draining the project area include Cypress Creek, Foster Creek, Redding Creek, and Tar Creek.

The aquatic communities found within these water bodies consist of a variety of fish and invertebrates that prefer slow-flowing, clear, and warm, sand-gravel bottom, 1st -3rd order streams. The diversity of plant and animal life in streams varies according to past and present land uses and practices within the watershed. These uses are generally agricultural (farming and cattle), commercial (small woodlots), and residential. All action alternatives exclude any ground disturbing activities in delineated wetlands. The U.S. Fish and Wildlife Service's National Wetlands Inventory maps were used to identify wetlands. Floodplains are present in the project area along major drains and will be protected inside any treatment stand.

Alternative 1-No Action

Direct/indirect effects- With the "No Action" alternative, water quality would be subject to the same influences and processes already in place. Changes in water yields would occur in response to storms, fire, beetle activity, and natural processes. Current surface runoff and streamflow would remain at its present state because none of the components of the action alternatives would occur. Stream turbity and sediment load would not increase above current conditions. There would be no adverse effects to floodplains and riparian areas. These areas would continue to function in the current state. The potential affects to aquatic wildlife species for this alternative would remain the same or become slightly lower over time as a result of no implementation of management activities.

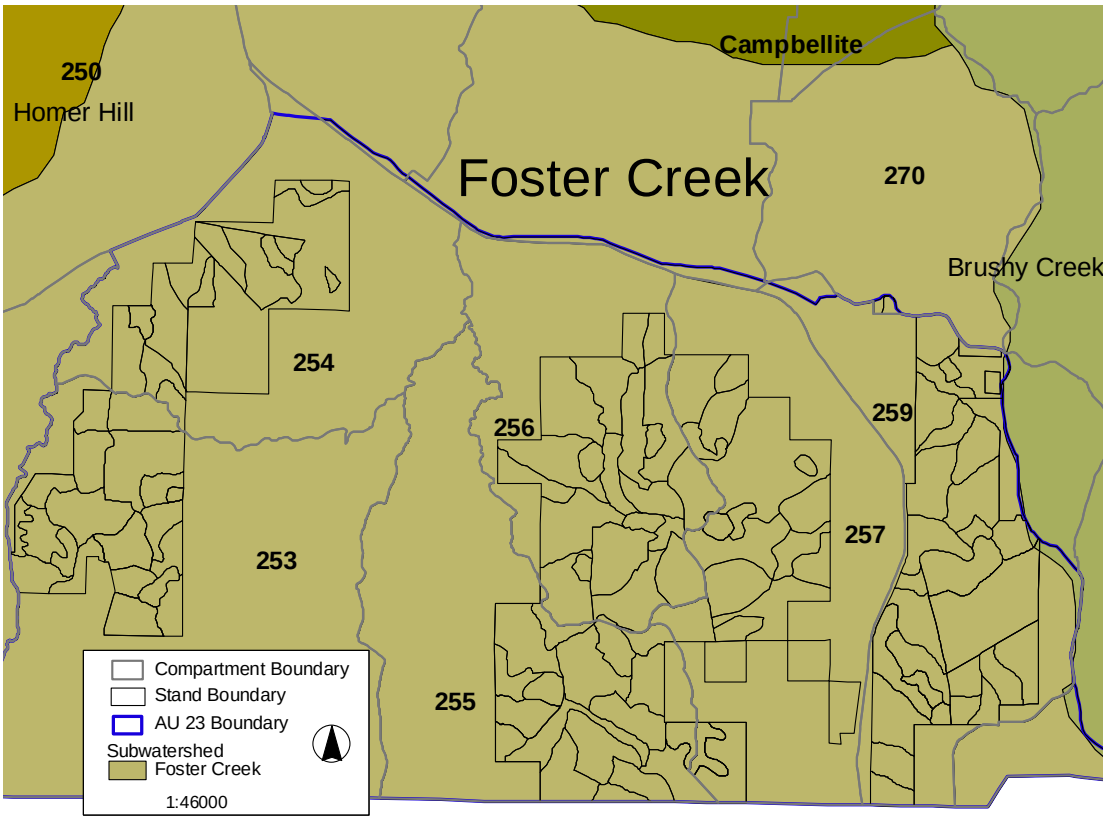

Figure 3.2. Foster Creek Watershed

In addition to the proposed alternatives, several areas within the project area are scheduled for prescribed burning and first thinning in separate decisions. Prescribed burning would remove fuels and dense undergrowth, thereby increasing surface runoff and streamflows. Prescribed burns would be conducted during appropriate weather conditions to maintain a low to moderate intensity fire. Moderate prescribe burns that retain ground cover but top-kill most plants should produce small increases in streamflow and channel sediment and negligible increases in surface runoff and erosion (Douglass, 1983).

The main effects of prescribed burning on water resources are the potential for increased runoff due to rain events. Prescribed burning itself usually does not affect water quality unless it is so intense that it consumes the duff and litter layer and exposes soils near streams (Marshall, 2008). When surface runoff increases after burning, it may carry suspended soil particles, dissolved inorganic nutrients, and other materials into adjacent streams and other water bodies, thus reducing water quality. These effects seldom occur after prescribed burns in Coastal Plains. Generally, a properly planned prescribed burn will not adversely affect water quality or quantity of ground or surface water in the South (USDA Forest Service, R8-TP 11, 1989). Surface runoff could increase on the areas proposed for first thinning. This increase in surface runoff would be temporary, lasting only until growth of existing vegetation and the establishment of new vegetation occur. Establishment of new vegetation and increased growth of existing vegetation should occur soon after the harvesting operations as

vegetation responds to increased sunlight reaching the forest floor and increased open space in the canopy.

Cumulative effects- To estimate increases in sediment resulting from management actions, the staff on the National Forests in Mississippi have utilized a computer model that analyzes past, present and proposed activities for sediment yield. This model projects the percent increase in sedimentation that would occur as a result of each alternative. Alternatives resulting in less than 1,650% increase over pre-European levels are deemed to have no cumulative impacts and beneficial uses (Clingenpeel 1999).

Cumulative effects on water resources for the Foster Creek watershed for Alternative 1 would result in an approximate 3.6% increase over baseline sedimentation. This represents an increase over the pre-European sediment load of approximately 316%.

Alternative 2-Proposed Action

Direct/indirect effects- Forest management activities can alter water quantity and quality, the degree of which determines the effects on aquatic communities (Grace, 2005). Water quantity generally applies to the size and frequency of stormflows, while water quality generally refers to the physical, chemical, and biological purity of water.

Surface runoff could increase on the areas proposed for thinning, clearcutting, and midstory removal. However, since the vegetation removed in timber harvesting is larger than that removed in midstory reduction work, the quantity of the increased water flow should not be similar. This increase in surface runoff would be temporary, lasting only until growth of existing vegetation and the establishment of new vegetation occur. Establishment of new vegetation and increased growth of existing vegetation should occur soon after the harvesting operations as vegetation responds to increased sunlight reaching the forest floor and increased open space in the canopy. Increased surface water runoff resulting from a decrease in infiltration rates of the soil due to compaction should be negligible after treatments. Skid trails and log landings would be areas most susceptible to compaction, but they represent a small percentage of the treatment area. Re-vegetating skid trails and log landings would minimize the effects of compaction and soil erosion. Slash, litter, and duff would buffer the soil against vehicle pressure, thus reducing compaction and surface runoff.

Effects of clearcutting and thinning would be mitigated by the use of streamside management zones (SMZs). Properly established (SMZs) reduce potential impacts of timber harvesting on streams (Summer et al, 2006). Mitigation measures applying to SMZs would limit disturbances and would specify the minimum standards of activity that can occur there--- standards that would maintain and enhance the stability and integrity of these areas. The mitigation measures that apply to these zones would greatly minimize the possibility of erosion, compaction, and sedimentation. SMZs for perennial streams must be a minimum of 66 feet in width. These areas provide important buffers, protecting streams and aquatic life from the upland management

activities. Roots of the vegetation within SMZs bind soil together, thus, stream banks are held together and excessive erosion is prevented. Vegetation within these zones provides shade for water temperature control; roughness of floodplains, reducing flood velocities, erosion, and downstream flood peaks; and large woody debris to channels, helping to dissipate stream energy and protect stream integrity.

Herbicide treatments would consist only of herbicides that have Human Health and Ecological Risk Assessments prepared. Site preparation and release with herbicides will introduce slightly toxic chemicals to the site. These herbicides may accumulate to a slight degree within the soil for five days to six months and translocate to nontarget vegetation. Effects of herbicides on water would be mitigated by following District Pesticide Safety Plan, pesticide labels, Material Safety Data Sheets (MSDS), and using selective herbicides within filter strip areas and around standing water.

Road maintenance, reconstruction, and temporary road construction could potentially contribute to the amount of sediment accumulated in the Project Area streams. Typical road construction and reconstruction activities are completed in the same year and usually during the same season. By employing road ditches, lead off ditches, culverts, and seeding of exposed road cuts and fills to disperse runoff, potential long-term effects of sedimentation on waterways can be minimized. Development and use of temporary roads will probably contribute some sediment in the short term. These roads are located on ridge tops, generally without direct lead-off into drainages. Potential for sedimentation reaching streams is very low. After restoration with a vegetative cover at the end of the project, the roads will not contribute to long-term effects that could be cumulative.

Cumulative effects- Alternative 2 would result in an increase over baseline sedimentation of approximately 5.9% for Foster Creek watershed. This represents an approximate increase over the pre-European sediment load of 325%. As shown in the table below the estimated sediment yield does not exceed the threshold for any alternative, indicating that affects to water quality and fisheries would not be significant.

Table 3.2. Estimated percent increase in sediment yield due to total future activities within the Foster Creek watershed by alternative.

	Alt 1 No Action	**Alt 2**	**Alt 3**
	(% sediment increase)		
Foster Creek			
Current baseline (tons/year)	14,321		
Pre-European baseline (tons/year)	3,565		
Percent increase of sediment above current baseline	4	6	6
Percent increase of sediment above Pre-European baseline	316	325	326

Alternative 3

Direct/indirect effects- Effects of this alternative would be similar to those in Alternative 2.

Cumulative effects-Alternative 3 would result in an increase over baseline sedimentation of approximately 6%. This represents an approximately 326% increase over the pre-European sediment load. As shown in the table above the estimated sediment yield does not exceed the threshold for any alternative, indicating that affects to water quality and fisheries would not be significant. There would be no additional cumulative effects to the water resources with the implementation of Alternative 3 with the proposed plan amendment.

3.1.3 Air

Affected Environment

The Homochitto NF is in a rural setting. Major land uses are for timber and agriculture. These lands contribute to the existing air quality in the area. The U.S. Environmental Protection Agency (EPA) considers the entire state of Mississippi in compliance with the National Ambient Air Quality Standards (NAAQS) which were developed under the Clean Air Act (MS DEQ 2008). These standards address a number of air pollutants including carbon monoxide, sulfur dioxide, particulate matter, nitrogen dioxide, ozone, and lead.

Alternative 1-No Action

Direct/indirect effects- Effects to air quality would be negligible under this alternative. Air quality standards would remain status quo in the project area. Due to the density of trees and vegetation in the project area, the possibility of wildfires exists. Wildfires could occur during adverse weather conditions that could cause smoke to disperse from the area or move to sensitive areas such as highways, airports, or populated areas.

Cumulative effects- This alternative would not increase the harvesting level that normally occurs on the forest. The amount and type of harvest equipment, fuel consumption, and emissions would not increase or decrease from year to year and would not increase pollutants from emissions beyond that which has occurred in the past and currently. Therefore, there would be no cumulative change to the air quality from what has happened in the past or is presently occurring. In terms of scale, activity would decrease from previous harvesting practices, which produce pollutants from fossil fuels.

Alternative 2-Proposed Action

Direct/indirect effects -Short-term effects on air quality are associated with dust from harvest activities, and exhaust from heavy equipment operation. The project would result in a small additional contribution of air pollutants. However, no part of the project area is having problems in meeting air quality standards (NAAQS), and Clean Air Act regulations provide for moderate increases in air pollution in the area, to accommodate economic growth. Air quality would remain substantially better than NAAQS. Air quality could be temporarily affected by prescribed burning. Air quality effects could include decreased visibility on roads, discomfort for local residents and forest visitors, and the nuisance of the smell of smoke in and around residences.

Cumulative effects-The anticipated adverse effects are production of emissions from equipment used in harvesting. With the presently accepted and utilized equipment common to the Homochitto National Forest and surrounding communities, these emissions cannot be avoided. Air quality and emissions inventories indicate that prescribed burning is not a major contributor to particulate matter in the atmosphere, and is therefore, not a threat to overall quality.

Alternative 3

Direct/indirect effects- Effects of this alternative would be similar to the Proposed Action. The proposed plan amendment would allow for more frequent prescribed burning for RCW habitat improvement (1 to 5 year burning rotation within HMAs). This and the increased use of growing season burning may increase the amount of smoke-produced particulate matter within the HMAs' air shed.

Cumulative effects- Effects of this alternative would be similar to the Proposed Action. This proposed amendment to the Forest Plan would add no additional cumulative effects to the air resources.

3.1.4 Minerals and Special Uses

Affected Environment

Within AU 23 approximately 3490 acres have privately owned minerals and approximately 1746 acres are under U.S. oil/gas leases (See Figure 3.3). There has been very little exploration of the privately owned lands and little is known of future activities. A 3-D sysmic project was performed across the entire analysis unit about ten years ago and drilling activity that has occurred is west of the analysis area. There are two oil fields in this analysis unit. One is located in compartment 254 stands 2,3,4,7, and 8; and the other is on the very south end of compartment 253 stands 2 and 11. All sites have been restored. There is a chance of someone reentering the area for exploration; this is why almost all U.S. minerals in this area continue to be leased. The leasing in the south portion of compartments 255 and 257 is speculative due to the

discovery of natural gas a couple miles to the south. No further exploration of natural gas is expected.

There are no active gravel pits within the analysis unit. There was once a source of material that has been depleted near the oil field in compartment 254, stand 4. The closest pit is the Bass Hill Pit in section 18, T4N R3E. There are two privately owned pits outside the analysis area that are in reasonable haul distance.

Spectra Energy operates a natural gas pipeline which traverses the southern portion compartment 259. Southwest MS electric Power Co. operates a transmission line across the north portion of compartment 254. Entergy operates a high voltage transmission line across compartments 254 and 255. Utility power lines, telephone cable and community water are located along the county roads on the north, east, and south sides of compartment 259.

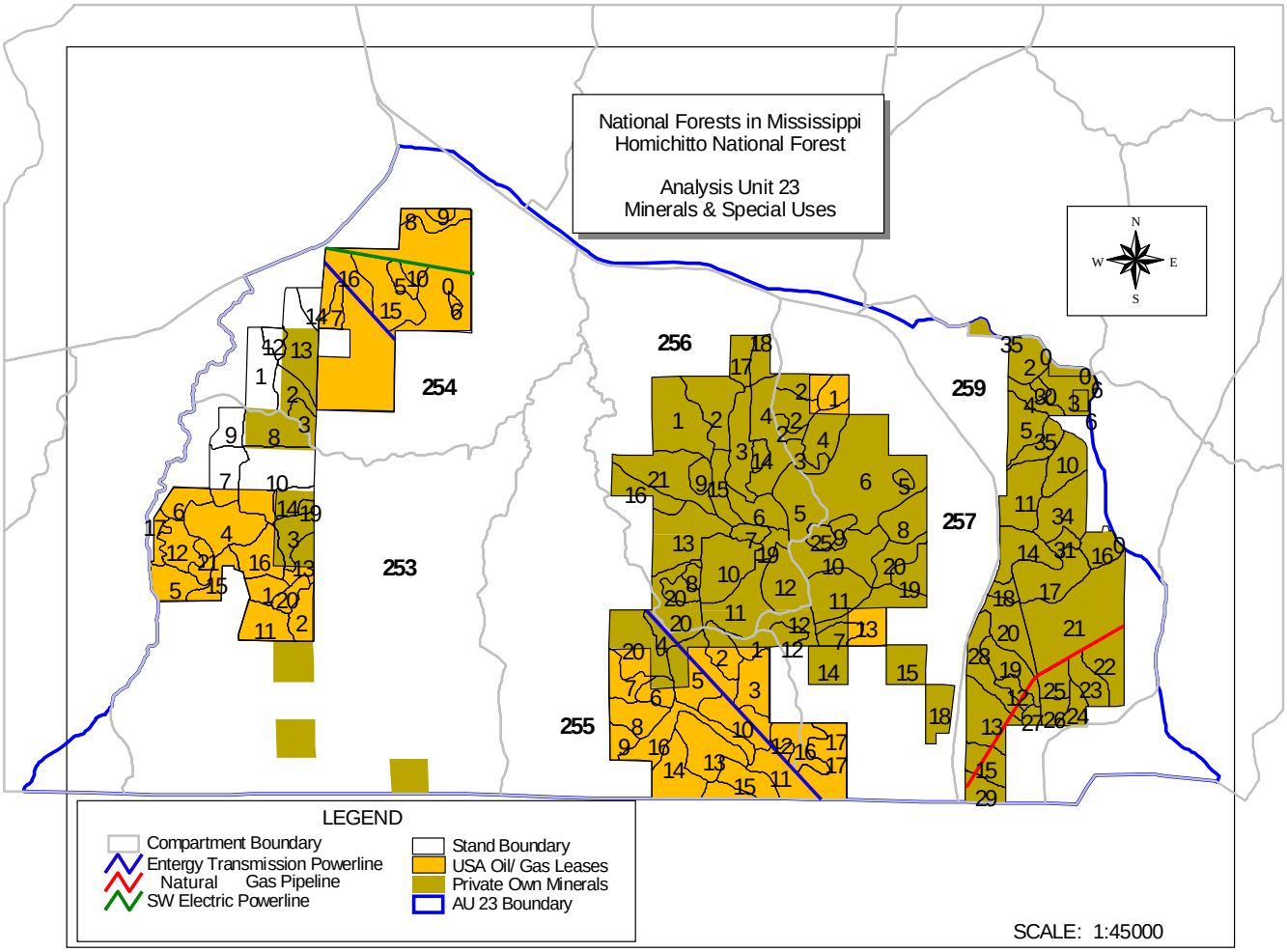

Figure 3.3. Mineral and Special Uses

Alternative 1-No Action

This alternative would have no direct, indirect, or cumulative impacts on minerals or special uses because no new actions would be implemented.

Alternative 2-Proposed Action

As regulated by the U.S. Department of Transportation, the interstate pipeline companies are responsible for maintaining the groundcover over pipelines and maintaining the right-of-way. On special use areas such as pipelines, powerlines, and oil and gas wells, the permittee is responsible for the maintenance of improvements and rights-of-way. When timber removal activities occur near mineral or special use areas, the typical mitigations that would be used are:

- Allowing crossing of pipelines and rights-of-way by equipment only at designated crossings
- Placing additional cover over pipelines at designated crossings as needed.
- Prohibiting skidding or driving along the rights-of-way.
- Protecting the integrity of the pipeline, powerline, or improvement.
- Protecting the pipeline, powerline, or improvement from damage

With the above mitigation, implementation activities would have no impact on minerals or existing special uses.

Alternative 3

Direct/indirect effects- Effects of this alternative would be similar to the Proposed Action.

Cumulative effects- Effects of this alternative would be similar to the Proposed Action. The proposed amendment to the Forest Plan would have no additional cumulative effects to the mineral resources.

3.1.5 Climate Change

Affected Environment

Climate change is an emerging issue for the Forest Service because of its potential impacts to forests and grasslands, and to society. The agency has begun considering climate change in policies, program guidance, and communications. Climate change effects include the effects of agency action on global climate change and the effects of climate change on a proposed project.

The use of motorized vehicles and equipment powered by petroleum products results in greenhouse gas emissions (primarily carbon dioxide emissions) that are believed to be the main source of accelerated climate change. The proposed action and the alternatives have the potential to indirectly result in varying levels of greenhouse gas emissions from equipment used during harvesting operations.

Climate change trends and expectations for the southeastern United States is the smallest scale currently available for assessing potential global climate change impacts. A review of United States Climate Change Science Program assessments (www.usgcrp.gov) describes varying scenarios for moisture regimes in the Southeast. Some areas in the Southeast may experience increased precipitation while others experience drier conditions. Based on current projections, the primary regional-level effects of climate change in the Southeast are expected to include: 1) warmer temperatures and a rising heat index, 2) moisture changes, 3) rising sea level and coastal erosion, and 4) increased extreme disturbance events (such as an increase in frequency and intensity of hurricanes and tornadoes occurring at greater than historical variability).

Alternative 1-No Action

The affects of this alternative on climate change cannot be meaningfully measured at the scope and scale of this project. Greenhouse gases mix readily into the global pool of greenhouse gases, and it is not currently possible (scientifically feasible) to determine the indirect effects of emissions from single or multiple sources at the project level. Estimating quantifiable differences in greenhouse gas emissions between alternatives would not lead to discernable measures of impacts on global climate change. While climate model simulators are continuing to be developed and refined, climate model projections typically do not currently have the capability of providing reliable predictive simulations of affects at the higher resolution (smaller-scale) needed for project-level analysis.

The proposed action and alternatives intuitively may result in varying levels of greenhouse gas emissions on National Forest administered lands, however the difference between alternatives are not discernable with respect to predicting impacts on climate change. While greenhouse emissions occurring on National Forest administered lands may vary by alternative an overall reduction in greenhouse gas emission is not guaranteed to occur. The activities may be displaced off National Forest administered land but may still occur elsewhere resulting in no net difference in overall greenhouse gas emissions affecting climate change.

This alternative would have no direct, indirect, or cumulative impacts on climate change because no change in actions would be implemented.

Alternative 2-Proposed Action

Direct/indirect effects- Effects of this alternative would be similar to the No Action.

Cumulative effects- Effects of this alternative would be similar to the No Action.

Alternative 3

Direct/indirect effects- Effects of this alternative would be similar to the Proposed Action.

Cumulative effects- Effects of this alternative would be similar to the Proposed Action. The proposed amendment to the Forest Plan would have no additional cumulative effects to climate change.

3.2 Biological Environment

3.2.1 Vegetation

Affected Environment

AU 23 is located in the Lower Thin Loess region of the Southern Mississippi Valley Silty Upland major land resource area. Loess is predominately a silt –sized particle that is transported and deposited by wind. The thickness of the loess tends to be greatest in the western portion of deposits and decreases in and easterly direction. The historic forest of AU 23 was considered to be longleaf pine prior to European settlement. Historically, in the South, loblolly pine was a minor species both on the uplands and the river bottoms and swamps (Shultz, 1997). Starting before the turn of the 20th century, clear-cutting and high grading followed by sporadic natural regeneration left many areas devoid of forest or sparsely populated by a few genotypes that were inferior to the harvested stands (Schmidtling 1998). In the reforestation that followed, longleaf pine was largely replaced by slash and loblolly pine because longleaf was found to be difficult to plant and slow in early growth (Larson 2002). In addition, the absence of fire on the landscape has contributed to the reduction of the longleaf pine species.

The desired future condition of the project area is to have mixed-pine ridges/oak-drainage ecosystem, which will recover declining wildlife populations for species such as the red-cockaded woodpecker, while continuing to support game and non-game species common to the Homochitto NF. Present vegetation conditions and age class distribution of the analysis area are shown in Table 3.3.

Table 3.3. Age class and vegetation type distribution for AU 23

Project Area Forest Type	2000-2010 0-10	1990-1999 11-20	1980-1989 21-30	1970-1979 31-40	1960-1969 41-50	1950-1959 51-60	1940-1949 61-70	1930-1939 71-80	1920-1929 81-90	<1920 91+	Total	%
UPLAND												
Longleaf									59	305	364	7%
Yellow Pine	0	634	873	844	181	0	23		295	1484	4334	78%
Slash											0	0%
Total upland	0	634	873	844	181	0	23	0	354	1789	4698	

Project Area Forest Type	2000-2010 0-10	1990-1999 11-20	1980-1989 21-30	1970-1979 31-40	1960-1969 41-50	1950-1959 51-60	1940-1949 61-70	1930-1939 71-80	1920-1929 81-90	<1920 91+	Total	%
% of pine	0.0%	13.5%	18.6%	18.0%	3.9%	0.0%	0.5%	0.0%	7.5%	38.1%	100.0%	
Pine/hwd				131					193	371	695	13%
Hwd/pine									0	47	47	1%
Btmld hwd					23				34	56	113	2%
TOTAL	0	634	873	975	204	0	23	0	581	2263	5553*	100%
%	0%	11%	16%	18%	4%	0%	0%	0%	10%	41%	100%	

*Approx. 176 acres of compartment 259 is within AU 21.

Yellow pine is the dominant component (78%) of the analysis area. The yellow pine component consisted mainly of loblolly and shortleaf pine species and contains a hardwood component of up to 30% (Forest Plan, p.4-26). The Hardwood and Pine/Hardwood communities are not dominant features (16%) of the analysis unit but are significant components and occur near drains and on productive sites at various areas within the mid- and overstory. Understory vegetation includes grasses, forbs, shrubs, and vines. Age classes are well distributed among older and younger stands throughout the analysis area.

One goal of the National Forests in Mississippi is to have 2.5% of the suitable land base to be considered as late seral (Forest Plan, p. 4-6). Late seral stands are areas set aside for large size trees, 18”-26” dbh. Table 3.4 and 3.5 lists the areas designated as late seral in AU 23 by alternatives.

Table 3.4. AU 23 late seral stands in Alternative 2.

Compartment	Stand Number	Forest Type	Age Year	Acres
253	12	Loblolly pine	1915	38
	15	Pine-Hardwood	1919	27
	17	Southern red oak-yellow pine	1919	14
254	2	Longleaf pine	1911	29
	3	Loblolly pine	1914	17
	7	Loblolly pine	1904	17
	8	Bottomland h/wd- yellow pine	1919	21
	14	Loblolly pine	1911	33
	16	Loblolly pine	1911	35
255	1	Loblolly pine	1911	22
	17	White oak-red oak- hickory	1911	16
256	17	Pine-Hardwood	1920	27
	18	Pine-Hardwood	1910	22
257	2	Loblolly pine	1915	69
	3	Loblolly pine	1915	19
259	15	White oak-red oak- hickory	1923	31
	18	Bottomland h/wd- yellow pine	1917	12

Table 3.5. AU 23 late seral stands in Alternative 3.

Compartment	Stand Number	Forest Type	Age Year	Acres
253	8	Pine-Hardwood	1895	52
	12	Loblolly pine	1915	38
	13	Pine-Hardwood	1903	19
	15	Pine-Hardwood	1919	27
	17	Southern red oak-yellow pine	1919	14
254	3	Loblolly pine	1914	17
	7	Loblolly pine	1904	17
	8	Bottomland h/wd- yellow pine	1919	21
255	1	Loblolly pine	1911	22
	8	White oak-red oak- hickory	1911	40
	17	White oak-red oak- hickory	1911	16
256	17	Pine-Hardwood	1920	27
	18	Pine-Hardwood	1910	22
257	2	Pine-Hardwood	1915	26
	18	Bottomland h/wd- yellow pine	1930	36
259	15	White oak-red oak- hickory	1923	34
	18	Bottomland h/wd- yellow pine	1917	12

Designation of late seral stands aides in addressing the Forest Service's goal of implementing old growth management on national forest lands. Typically, attributes of old growth forests include: 1) large trees for the species or site, 2) wide variation in tree sizes and spacing, 3) accumulation of large-sized dead standing and fallen trees, 4) decadence in the form of broken or deformed tops or boles and root decay, 5) multiple canopy layers, and 6) canopy gaps and understory patchiness. The Homochitto Ranger District identified 24 stands within the project area that have the *potential* of becoming old growth forests. These stands are shown below.

Compartment	Stand	Forest Type	Age Year	Acre
	15	Pine-Hardwood	1919	27
253	17	Southern red oak-yellow pine	1919	14
	19*	Loblolly pine	1888	5
	20	Longleaf pine	1930	17
	21	Shortleaf Pine	1926	18
	5	Loblolly pine	1919	15
254	6	Loblolly pine	1909	5
	7	Loblolly pine	1904	17
	8	Bottomland h/wd- yellow pine	1919	21
	10	Loblolly pine	1919	10
	1	Pine-Hardwood	1911	22
255	17	Loblolly pine	1911	16
	7	Shortleaf Pine	1920	15
	9	Shortleaf Pine	1920	18
256	17	Pine-Hardwood	1920	27
	18	Pine-Hardwood	1910	22
	19	Shortleaf Pine	1920	16
	3	Loblolly pine	1915	19
	5	Loblolly pine	1921	7
257	7	Longleaf pine	1921	21
	9	Longleaf pine	1910	14
	18	Loblolly pine	1930	36
	15	White oak-red oak- hickory	1923	34
259	18	Bottomland h/wd- yellow pine	1917	12

* Only stand that currently meets all old growth criteria. All other stands are too young. No treatments scheduled for this stand.

The Homochitto has many State listed plants species, generally called "plants of special concern". The silky camellia, Florida Keys hempweed, single-headed pussytoes, appendaged lobelia, swamp hickory, Allegheny spurge, eared goldenrod, and crested fringed orchid are confirmed or likely inhabitants of the Homochitto. The eared goldenrod (*Solidago auriculata*) was the only state plant species of special concern that was found within Analysis Unit 23; however there is a likelihood that other state listed plants could be found with a more thorough survey. Many Forest Service Sensitive plants are also found within the Analysis Unit. These plants are discussed in the Forest Service Sensitive Species section of this chapter.

Solidago auriculata (eared goldenrod)
Eared goldenrod is associated with old growth hardwood forest and mesic slopes. It is a locally rare species. Several plants were located in 2006 within the project area. This site will be avoided during harvest operations. Therefore there will be no impact to this species from forest management activities.

Alternative 1-No Action

***Direct/indirect effects* –** this alternative would indirectly defer meeting the desired future condition to achieve management area goals. The over-stocked pine stands would remain susceptible to disease and insect outbreaks. Also, with the retention of overstocked stands, the closed canopy would inhibit the growth of the herbaceous species along the forest floor.

Cumulative effects - The growth of the trees would decrease and the overall health of the stands would diminish. Stands would continue to mature, meeting the desired late seral habitat, but the early seral habitat would continue to be diminished. The cumulative effects to the sensitive and state listed plants should be discountable and therefore are not expected to impact these species.

Alternative 2-Proposed Action

Direct/indirect effects - The proposed treatments of thinning would increase growth, vigor, quality, and productivity of the residual trees. Thinning would also reduce the susceptibility to bark beetle infestations by increasing the spacing between pines in the stand and improve the stand health and growth by reducing competition. The forest canopy would be opened up and sunlight would be able to reach the forest floor, increasing the growth of desirable herbaceous species and increasing species diversity. Equipment used to perform the thinning activities may damage and reduce the current herbaceous plant cover of the forest floor.

Regeneration methods would provide a continuing mosaic of different age classes representing stages of forest development from seedlings to mature stands. Stand diversity would be ensured by having reserve trees, hardwood stringers, and den trees within the proposed harvest areas. Restoration efforts would provide that early seral age that is essentially lacking at the present time. Alternative 2 (452 ac) would provide more early seral habitat than Alternative 3 (441 ac). Site prep activities including chemical application and burning would help prepare a seed bed and facilitate seed germination by reducing ground litter and vegetation. Any reduction in herbaceous or woody vegetation would only be temporary. Follow up treatments would consist of release of seedlings from competition using chemical and/or mechanical methods. Midstory removal treatments would decrease the woody vegetation that inhibits the growth of herbaceous grasses. Midstory treatments would also reduce the fuel buildup within these areas.

Eight stands identified as potential old growth have thinning treatments scheduled. This stands are *planned* RCW recruitment clusters (C253/20, C256/9, C256/19, C257/5, C257/7, and C257/9) or existing RCW recruitment clusters (C256/7). Thinning would also occur in stand C257/18. All other stands identified as potential old growth are designated late seral or no treatments are schedule.

The herbicides considered for use in this project area are triclopyr, imazapyr, hexazinone, glyphosate, and sulfometuron-methyl for site prep, release, noxious weed eradication, and midstory control. These herbicides control woody species as well as broadleaf weeds. The intended methods for herbicide use for site prep would consist of direct cut surface application to woody species, directed foliar spray, streamline, or soil spot treatment. For noxious weed eradication, release and midstory work; triclopyr and imazapyr would be used in foliar spray, streamline, or cut surface application. There could be some damage to the surrounding native herbaceous community, but because most of the groundcover is woody, little damage would be expected to the herbs and forbs

Triclopyr is a herbicide that mimics auxin, a plant growth hormone, thus disrupting the normal growth and viability of plants (SERA 2003). It is translocated up and down in plants and accumulates in plant roots and root collars killing root systems as well as above-ground portions of trees and other woody vegetation Imazapyr is readily absorbed through foliage and roots and is translocated rapidly throughout the plant, with accumulation in the meristematic regions. As the woody vegetation is killed, control would be achieved. Indirect kill through soil mobility of imazapyr would be minimized because herbicides would not be directed to the soil. Imazapyr is phytotoxic at extremely low concentrations. Nontarget plants could be adversely affected from drift, but drift effects would be minimized by applying the herbicides low to the ground and using a low concentration of herbicide. Glyphosate is a growth inhibitor that is absorbed by foliage and translocates throughout the plant, eventually accumulating in the roots. Hexazinone inhibits photosynthesis and, at higher levels of exposure, inhibits the synthesis of RNA, proteins, and lipids in plants (SERA 2005). Hexazinone is season sensitive and is the least effective in the dormant or late growing season. Sulfometuron methyl inhibits acetolactate synthase (ALS), an enzyme that catalyzes the biosynthesis of three branched-chain amino acids, all of which are essential for plant growth. Damage to sensitive nontarget species could be expected in ground broadcast applications at distances of about 900 feet from the application site in areas in which off-site drift is not reduced by foliar interception (SERA 2004). This risk characterization applies only to ground broadcast applications. When used in directed foliar applications (i.e., backpack), offsite drift could be reduced substantially.

Cumulative effects - Implementation of this alternative is not expected to have a measurable negative cumulative impact on vegetation. Other actions which are reasonably foreseeable may include, but are not limited to, prescribed fire on a landscape scale, first thinning treatments, and road & Right-of-Way maintenance. The effects from these activities when combined with the expected effects of the proposed action should not produce cumulative adverse or undesirable impacts on vegetation in this analysis area.

Alternative 3

Direct/indirect effects - Effects of this alternative would be similar to the Proposed Action. Incorporating the proposed plan amendment of Alternative 3 may directly affect vegetation through the cutting and removal of additional overstory and mid-story for foraging habitat improvement within the HMAs. Stands being managed for Good Quality Foraging Habitat (GQFH) are targeted to contain at least 18 or more pine stems/acre that are larger than 14" dbh and older than 60 years old, with a minimum BA of 20 ft^2/acre; pines less than 10" dbh would have a maximum BA of 10 ft^2/acre with less than 20 stems/acre. Additional mid-story hardwoods may be cut or killed in order to open up areas near active RCW and recruitment clusters.

Density and diversity of overstory vegetation within HMAs may decrease as a result of direction favoring more open stands for RCW nesting and foraging habitat. Within-stand hardwoods may become less abundant within ½ mile of active and recruitment RCW clusters due to a higher emphasis on mid-story control work and shorter prescribed fire intervals. Understory vegetation would become more abundant and diverse for the same reasons.

Denser groundcover vegetation could carry surface fire more easily and thereby enhance the effectiveness of prescribed fire for re-establishing native plant communities. On the other hand, more frequent prescribed burning for RCW habitat improvement (1 to 5 year burning rotation within HMAs) may reduce the availability of fuels on less productive sites.

Eight stands identified as potential old growth have thinning treatments scheduled. This stands are *planned* RCW recruitment clusters (C253/20, C256/9, C256/19, C257/5, C257/7, and C257/9) or existing RCW recruitment clusters (C256/7 and C257/3). All other stands identified as potential old growth are designated late seral or no treatments are schedule.

Cumulative effects - Effects of this alternative would be similar to the Proposed Action. Under guidance of the proposed Forest plan amendment, the average age and size of overstory vegetation near RCW clusters within the HMAs may become older as requirements for GQFH are met.

Over time, more frequent prescribed burning within HMAs for RCW habitat improvement may affect overstory species composition within the HMAs by decreasing the abundance of some mesic hardwoods such as sweetgum and improving site conditions for the development of upland species like oaks. Groundcover vegetation would also be expected to change more quickly from fire-intolerant to fire tolerant species. More frequent fires, especially during the growing season, would gradually restrict development of woody species and promote herbaceous species (RCW Recovery Plan, p. 106).

3.2.2 Forest Health

Affected Environment

Fire disturbance, forest pests, and non-native invasive plants, such as cogon grass and kudzu are the primary agents influencing forest health. Age, forest density, and species diversity are contributing factors which can influence how a forest will react to a particular agent.

Fire-The primary driving influence in the southern ecosystem is fire. Fire controls ground-level vegetation and the types of regeneration methods that are probable. Frequent fires on the ridges favor longleaf pine, and shortleaf pine to a lesser extent. Seedlings of both of these species have fire survival strategies which allow them to regenerate under historic fire conditions. Loblolly pine is resistant to lower-intensity fire, as is oak, which readily re-sprouts and has thicker bark for insulation. Fire also controls midstory and favors a grass, forbs, legume, and low shrub understory.

Using a two- to three-year cycle, a prescribed burn typically removes approximately three tons of fuel per acre. Without prescribed burning, accumulated fuels would present an additional fire hazard. Because of the high humidity and warm temperatures, rapid decomposition typically limits the accumulation of fuels to a 5-10 year build-up, depending on a variety of site/location factors. Fuel and deadfall buildup would not be cumulative beyond that point. However, this higher level of deadfall and the increase in woody brush and understory components create competing habitat and populations that were not typically present prior to reductions in burning. Developing the historic, fire-dependent, interior pine forest conditions is a stated purpose and need for this project. Prescribed burning in AU 23 will occur on 2818 acres over a 2-3 year rotation. This is covered under a separate decision.

Southern Pine Beetle- - Bark beetles are among the most destructive pests of southern pine forests and the southern pine beetle is by far the most important tree killer (Fettig et al, 2007). Endemic populations of SPB are a natural presence in the forest, but periodically the population of these insects explodes, resulting in an outbreak or epidemic. The most recent southern pine beetle outbreaks in Analysis Unit 23 occurred in 1995 and 2002 (Figure 3.4). Fortunately, the outbreaks were contained to a small size. Current evidence indicates no increase of populations or outbreaks in the near future.

Many interacting factors may contribute to the start of southern pine beetle outbreaks. The most favorable condition is a large expanse of maturing and mature pine forests. This may occur in even-aged forests where trees of about the same age grow together in stands, or in uneven-aged forests where a range of tree sizes and ages may be present. An outbreak may be triggered by one or more events that reduce tree health and vigor, such as droughts, lightning, floods, and wind or ice storms. Slow-growing, un-thinned or over-mature pine stands have also been associated with southern pine beetle outbreaks. Once favorable conditions exist, the very high reproductive potential of the

southern pine beetle enables this pest to quickly reach outbreak status. If sufficient numbers of beetles respond to the attractant pheromones, even the healthiest trees will be successfully attacked.

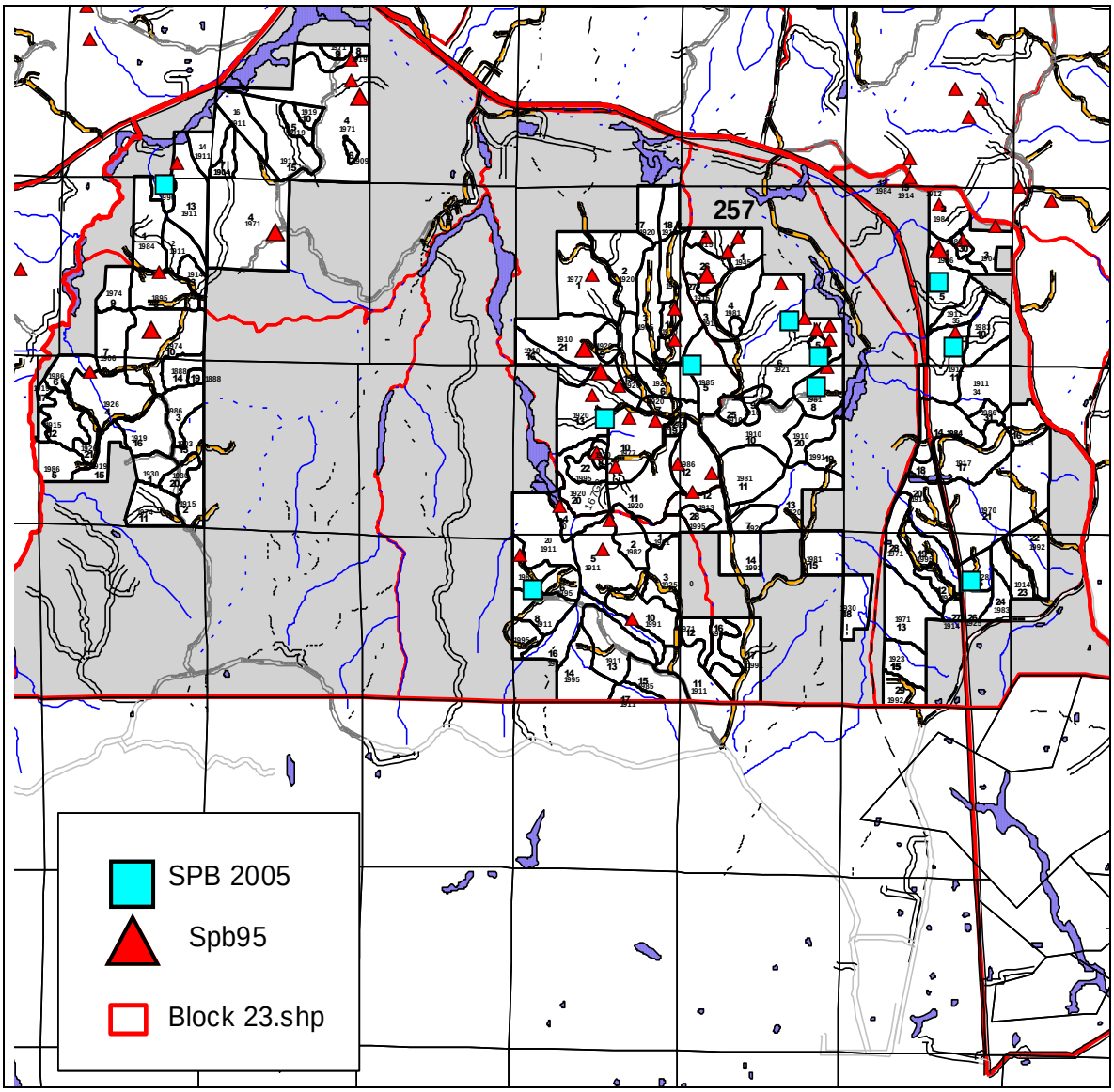

Figure 3.4. 1995 & 2002 Southern Pine Beetle Outbreak

There are two primary integrated pest management strategies for management of southern pine beetle hazard (The Integrated Pest Management Decision Key for National Forests in Region 8):

1. Over-mature, low vigor stands should be regenerated to stands with younger, more vigorous trees. The 70-80 year old loblolly pine stands that dominate many of the upland sites in this Analysis Unit fall into the category of low vigor. These sites were historically occupied by longleaf mixed with shortleaf and some loblolly pine on the

lower slopes. Loblolly pine is off-site on these sites and is in deteriorating health over much of this Analysis Unit.

2. Thin over-stocked stands and stands that cannot be regenerated due to other multiple-use resource considerations in order to reduce hazards. There is a direct relationship to tree density (crowding) and the incidence and severity of southern pine beetle spots. Thinning has been demonstrated to reduce hazard.

Table 3.8 gives the acres within each SPB hazard rating of AU 23

3.6 Southern pine hazard rating in AU 23.

Low Risk	Moderate Risk	High Risk	Non-susceptible	Unclassified	Total Acres
211	1717	3354	103	8062	13447

Species of southern yellow pine differ in their susceptibility to SPB. Longleaf pine is relatively resistant because of its ability to "pitch out" attacking beetles in resinous exudations. Loblolly pine tends to be highly susceptible in this area, depending on stocking, growth, site, and age. High stand density, as measured by basal area (BA), is a major causal factor in SPB infestations. Forest Service response to SPB infestation in AU 23 will occur under the SPB-EA (SPB-EA 2008).

Non-native invasive- Invasions of nonnative plants into southern forests continue to go unchecked and unmonitored. Invasive nonnative plants infest under and beside forest canopies and occupy small forest openings, increasingly eroding forest productivity, hindering forest use and management activities, and degrading diversity and wildlife habitat (Miller 2003). Often called nonnative, exotic, nonindigenous, alien, or noxious weeds, they occur as trees, shrubs, vines, grasses, ferns, and forbs. Without their natural predators of insects and diseases, these plants now increase across the landscape with little opposition, often beyond control and reclamation measures.

Noxious weeds are found on every part of the National Forest in Mississippi. Few, if any, compartments would be found to be absent of any noxious weed. Current efforts are focused on two species that are the most troublesome and seem to have the most potential for destructive spreading over large areas. Kudzu (*Pueraria montana*) and cogongrass (*Imperata cylindrical*) are the species of most concern at present time due to the large areas covered by them and the fact that both species have the ability to render acres they occupy useless for other native species. Other species such as Chinese wisteria (*Wisteria sinensis*), Japanese climbing fern (*Lygodium japonicum*), Japanese honeysuckle (*Lonicera japonica*), Japanese privet (*Ligustrum japonicum*), Chinese privet (*Ligustrum sinense*), and Chinese tallow (*Triadica sebifera*) currently are of secondary priority and are treated on a case-by-case basis at the project level. Forest Service response to non-native invasive species in AU 23 will occur under the Invasive Exotic Plant Control through Integrated Pest Management EA (IPM-EA 2006).

Alternative 1-No Action

Direct/indirect effects- This alternative defers opportunities for regeneration and thinning. AU 23 would continue to be influenced by natural processes such as insects, disease, wind damage, and wildfires. As pine stands mature, particularly in the absence of thinning, they become more vulnerable to southern pine beetle infestations and disease. Tree mortality from red heart, wood borers, and defoliators are likely to become more prevalent in the project area as older trees become less able to resist disease and insect infestations. In addition, age class distribution would become unbalanced, resulting in limited future mature pine stands. There will be no direct effects to non-native plant species with this alternative. No mechanical equipment would be used in this alternative, thus reducing the spread of non-native species that may be transported between sites.

Cumulative effects - if the no action alternative is followed across the forest, there would be a negative effect when trees exceed their biological rotation. High mortality can be expected as these trees lose vigor as a result of old age and are attacked by insects (SPB), disease, and decay. High mortality could also be expected in younger stands that remain unthinned. The trees are currently stressed due to the crowding and loss of vigor associated with environmental conditions (competition for sunlight, moisture, nutrients, etc.). When stand density exceeds 100 sq.ft./acre BA, SPB risk is highest. Therefore, the frequency and severity of SPB attacks is expected to increase over time. Non-native species may continue to grow, thus altering or eliminating native plant communities.

Alternative 2- Proposed Action

Direct/indirect effects - The actions in this alternative are designed to initiate the first phase of a long-term goal to achieve the desired future conditions of healthy, sustainable forest ecosystems by using comprehensive integrated approaches designed to prevent and minimize resource loss damage due to insects, diseases, invasive plant species, or wildfire within the project area.

Thinning treatments and regeneration methods are proposed in each alternative. These stands are densely stocked with total BA nearing or exceeding 100 ft^2/ac. Because stand densities greater than the optimum desired conditions stress pines and impedes radial growth, pine stands become more susceptible to bark beetle infestation (SPB FEIS). Risk of insect and disease infestation would be reduced and the overall health of the forest would be improved if the action alternative is implemented.

The proposed harvesting activities may promote the spread of non-native plant species. By disturbing areas occupied with non-native species, seeds may be spread by wind into un-infested areas. Logging also damages native vegetation and disturbs the soil surface, making it easier for noxious weeds to invade. Soil disturbances will be minimized to no more than needed to meet project objectives. Logging practices such

as reusing temporary roads, skid trails, and landings, may be used to reduce soil disturbance. These areas should be reseeded with native species after use.

Equipment operating within infested areas may transfer non-native plant seeds or plants between sites throughout the forest. Equipment that is known to be working within an infested area would be cleaned of soil, seeds, vegetative matter, or other debris that could contain or hold seeds prior to moving onto another site.

Cumulative effects - The positive cumulative long term effects of timber management activities would be the maintenance of a vigorous, healthy forest beneficial to forest users and wildlife species. The regeneration of mature loblolly pine would reduce stand susceptibility to SPB by creating younger, more vigorous stands.

Alternative 3

Direct/indirect effects - Effects of this alternative would be similar to the Proposed Action. Guidance under the proposed forest plan amendment allows the maintaining of lower basal areas within the HMAs, especially those dominated by loblolly pine. This would lower the overall risk of SPB infestation. The provision for regeneration openings within ½ mile of an active or recruitment cluster, providing a foraging analysis shows adequate foraging remains post-project (instead of allowing no pine regeneration within ¼ mile, as directed in the interim guidelines), would provide more opportunities to create healthier forest ecosystems within the HMAs by restoring native plant communities.

Cumulative effects - Effects of this alternative would be similar to the Proposed Action. Because longleaf pine trees are more resistant to SPB infestation and expansion, as projects are implemented over time under the proposed Forest Plan amendment, the increased rate of change from loblolly pine dominated HMAs to ones dominated by longleaf ecosystems could reduce losses associated with SPB epidemics.

3.2.3 Threatened & Endangered Species

Affected Environment

A Biological Evaluation was prepared and documents the determination of effects for Threatened, Endangered and Sensitive (TES) Species. The U.S. Fish and Wildlife Service has provided concurrence for the BE. The BE is located within the project folder for Analysis Unit 23. The determinations listed within the BE state that the Forest Service action alternatives are not likely to adversely affect the endangered red-cockaded woodpecker and the threatened Louisiana black bear.

Table 3.7: Threatened and Endangered Summary of Conclusions of Effects

Species	Occurrence on Homochitto NF	Proposed Action Alt 2	No Action Alt 1	Alt 3
Red-cockaded woodpecker	Confirmed	NLAA	NLAA	NLAA
Louisiana black bear	Potential	NLAA	NE	NLAA

NE = No Effect; NLAA = Not Likely To Adversely Affect; LAA = Likely To Adversely Affect

There is no creditable evidence of black bears in or near the analysis area, however, black bears are known to move large distances and there is a possibility of a bear using the analysis area. Black bears exist primarily on bottomland hardwood and floodplain forest, although use of upland hardwood, mixed pine-hardwood and coastal flatwoods and marshes has been documented. Black bears are adaptable and opportunistic and forest management practices, in general, have much less impact on black bear than road density with unrestricted traffic.

Within the Analysis Unit 23 Project Area, the red-cockaded woodpecker is the only threatened or endangered species known to have consistently occurred. At the present time, there are no known active clusters in the project area. Analysis Unit 23 is completely within the boundaries of the proposed red-cockaded woodpecker habitat management area. All sites of pine and pine-hardwood greater than 30 years of age within the project area were surveyed to determine if any new clusters had become established. No evidence of the establishment of a new cluster was found.

The designated red-cockaded woodpecker (RCW) habitat management area (HMA) of the Homochitto NF consists of approximately 102,809 acres of potentially suitable habitat targeting the population objective for the active RCW clusters. Approximately 54% of the Homochitto NF is designated as potential RCW HMA. There are currently a total of 94 active RCW clusters on the Homochitto RD, but none within the project area (See Figure 3.5).

Yellow pine forests dominate about 78% (Table 3.8 below) of the total project area and 60% of the suitable foraging acres. This data indicates that significant activity is needed to progress toward to meeting the goal of having a fire dependent ecosystem which favors longleaf pine forests.

Table 3.8. Available RCW foraging acreage in project area.

	Ages Unsuitable for RCW			Ages Suitable for RCW								
Project Area Forest Type	**2000-2010 0-10**	**1990-1999 11-20**	**1980-1989 21-30**	**1970-1979 31-40**	**1960-1969 41-50**	**1950-1959 51-60**	**1940-1949 61-70**	**1930-1939 71-80**	**1920-1929 81-90**	**<1920 91+**	**Total**	**%**
Longleaf									59	305	364	7%
Yellow Pine	0	634	873	844	181	0	23		295	1484	4334	78%
Slash											0	0%
Pine/hwd				131					193	371	695	13%
Total Suitable Forest Types	0	634	873	975	181	0	23	0	547	2160	5393	
% of Total	0.00%	11.76%	16.19%	18.08%	3.36%	0.00%	0.43%	0.00%	10.14%	40.05%	100.00%	
Unsuitable Forest Types												
Hwd/pine									0	47	47	1%
Btmld hwd					23				34	56	113	2%
TOTAL	0	634	873	975	204	0	23	0	581	2263	5553*	100%
%	0%	11%	16%	18%	4%	0%	0%	0%	10%	41%	100%	

*Approx. 176 acres of Compartment 259 is within AU 21.

An emphasis would be placed on activating recruitment stands C256/7, C256/14, C257/3, and C257/25 as an effort to increase the most desirable habitat for RCW. Clusters in the project area and in the vicinity of the project area are shown in the figure below. The nearest active cluster is over a mile from the project area and over two miles from the nearest cluster within the project area. Establishing the clusters within the project area would create a suitable corridor for RCW management by linking active clusters in adjacent Analysis Units.

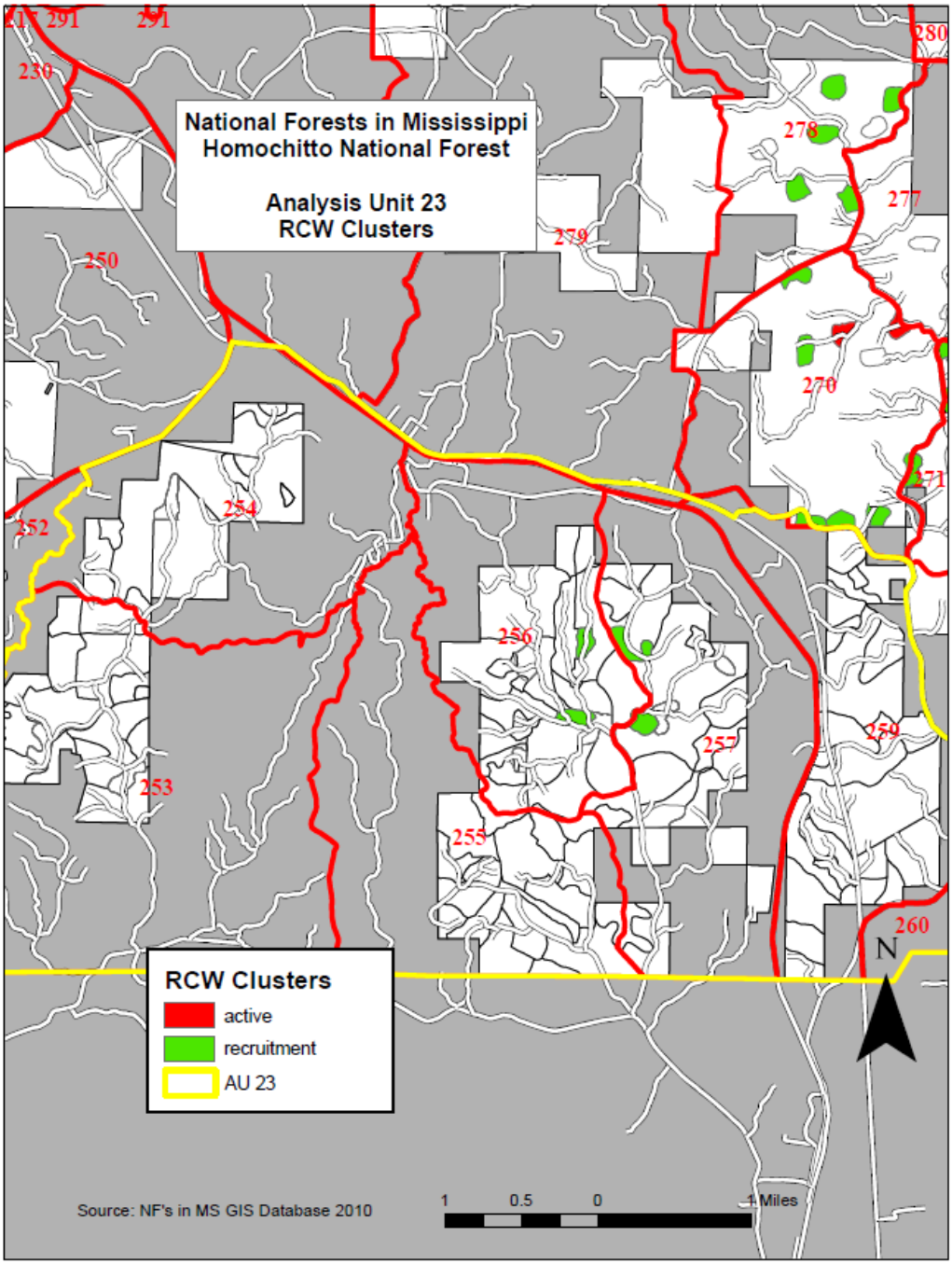

Figure 3.5. Map showing RCW clusters in the project area and surrounding vicinity.

Alternative 1 – No Action

Direct/indirect effects **–** Environmental changes would occur naturally due to biological changes, prescribed fire, weather, insects and diseases. No harvesting would occur to improve the longleaf ecosystem habitat for the present and the future needs of the RCW, reducing the chance of providing active clusters within the project area in the long-term. Herbicides would not be applied to eliminate woody

understory. Loblolly pine species would continue to dominate the area. Prescribed burning would continue to improve the RCW habitat to a limited degree.

Cumulative effects **-** This alternative allows all habitats to age without replacement. By not implementing forest health thinning, which can also be used to reduce midstory, potential RCW habitat degrades and is at greater risk of insect and disease loss. Without midstory control treatments the understory would likely be dominated by mixed hardwoods with a preponderance of shade tolerant species. Such stands do not support the recovery objectives for RCW on the Homochitto National Forest.

Alternatives 2

Direct/indirect effects **–** The treatments proposed in the RCW HMA are depicted below by acreage for each alternative.

Table 3.9. Alternative treatments proposed within the project area in the designated RCW HMA

Proposed Activity	No-Action	Alternative 2	Alternative 3
Project Area	5377 acres	5377 acres	5377 acres
Thinning: First Intermediate	1018 acres* 0 acres	407 acres 1967 acres	560 acres 1341 acres
Longleaf Restoration cut	0 acres	342 acres	396 acres
Shelterwood Method	0 acres	440 acres	174 acres
Site Prep. – Herbicide/Burn	0 acres	782 acres	570 acres
Planting Longleaf	0 acres	342 acres	396 acres
Release	0 acres	782 acres	570 acres
Pre-commercial Thin	0 acres	782 acres	570 acres
RCW Midstory Work	0 acres	118 acres	1332 acres
Ephemeral pond construction	0 ponds	55 ponds	55 ponds
Bat boxes	0 boxes	222 boxes	222 boxes
RCW cavity inserts	0 Inserts	84 Inserts	84 inserts
System road improvement	0 miles	23 miles	20.2 miles
System road construction	0 miles	0 miles	1.2 miles
Temporary road construction	0 miles	5.5 miles	5 miles
Late seral designation	231 acres	452 acres	441 acres
0-10 age class	0 acres	782 acres; 14%	570 acres; 11%

* Acres from 1st thin EA

All action treatments shown in the table above would be beneficial to the RCW and its habitat, at different levels and periods in time. Longleaf pine restoration would provide future RCW habitat by removing older loblolly pines and planting longleaf pine. This would help re-establish the longleaf pine component in the area. Regeneration would

provide age-class diversity of stands and help sustain habitat over time. Management using the shelterwood method, where residual trees are retained for some time then harvested once seedlings become established; provide foraging for the RCW and help reduce habitat fragmentation.

The proposed thinning would emphasize longleaf pine retention in predominant yellow pine stands, working toward the desired mixed pine ecosystem. Thinning in all action alternatives would open the canopy, reduce midstory, and stimulate herbaceous community development, which also improves the RCW habitat to meet more of the desired conditions. Effects to the RCW have been fully analyzed and concurrence has been received from US Fish and Wildlife Service. See Biological Evaluation (Appendix B).

In conjunction with burning, release and pre-commercial thinning in the young pine stands would improve understory conditions that would grow the desired native grass forbs understory and promote diversity and the growth of the desired longleaf canopy. Herbicide applications should have little to no impact to the RCW. The low toxicities of the proposed formulations would not be expected to harm RCW's or any wildlife. Bird toxicities are: Imazapry – bobwhite quail LD_{50} > 5,000 mg/kg; Triclopyr LD_{50} = 849 to 2,055 mg/kg; Glyphosate LD_{50} > 2000 mg/kg; Hexazinone – bobwhite quail LD_{50} = 2,258 mg/kg; Sulfometuron Methyl – mallard ducks LD_{50} >5,000 mg a.i/kg.

Cumulative effect **-** The availability of pine forests alone will not satisfy the habitat requirements for RCW. The special, critical needs of this species are "over-mature" (preferably longleaf pine) pine stands with some redheart diseased trees for natural cavity construction, and limited hardwood midstory vegetation. Midstory vegetation was historically controlled by fire, and other economically feasible, broad scale controls have not been developed. Fire also encourages a grassy ground cover, which is the primary source of insects, which migrate to the boles of overstory trees and provide the bird's food source. Regionally, forested acres are relatively stable and are not predicted to decline substantially for the foreseeable future. Local trends seem to confirm regional projections as substantial acreage of row crop and pastureland have been reforested in recent years.

This project, and all other projects implemented or planned on the Homochitto National Forest, is designed to comply with the direction in the recovery plan for the red-cockaded woodpecker, the RCW EIS, and the 1991 interim guidelines. This direction includes the level, distribution, and type of harvests allowed. The actions proposed in Alternative 2 currently do not comply with the directions of the previously stated documents.

Alternatives 3

In May of 1990 the National Forests in Mississippi Forest Plan was amended (Amendment #8) to incorporate The Interim Standards and Guidelines for the Protection and Management of RCW Habitat within ¾ mile of Colony Sites. These

interim guidelines were developed consistent with the first revision of the RCW Recovery Plan approved on April 11, 1985. In June 1995 the Forest Plan was amended again (Amendment #14) to designate our tentative HMA and outline direction on select silvicultural treatments to be applied outside the ¾ mile zone. The USFWS approved a second revision of the RCW Recovery on January 27, 2003, prompting the need to modify the original interim guidance to conform to revised RCW habitat management guidance in the 2003 RCW Recovery Plan.

The Interim Standards and Guidelines for the Protection and Management of RCW Habitat within ¾ mile of Colony Sites no longer reflect the latest science regarding RCW habitat management and species recovery. The USFWS 2003 RCW Recovery Plan outlines the actions, to the best current understanding, necessary to recover red-cockaded woodpeckers. Implementation is accomplished through incorporation of management guidelines identified in the Recovery Plan Revision into agency decision documents. This Analysis Unit, within the Homochitto tentative HMA, presents our first opportunity to incorporate this revised direction on the Homochitto National Forest.

Desired Condition

The desired condition is that all references to RCW management be based on the most current information for the successful recovery of the species.

Need for Change

Currently, the Interim Standards and Guides limit our restoration efforts within the ¾-mile cluster radius to a maximum of 25 acres of regeneration. Not more than 25% of the area (in the ¾-mile zone) can be less than 30 years old post-treatment and no more than 8.5% can be less than 10 years old post-treatment. The Recovery Plan allows up to 40 acres of restoration in the ½-mile radius and 80 acres of restoration one mile away from an active/recruitment cluster. An example of this in regards to AU-23 can be seen in the table below:

Table 3.10 Comparison of Restoration/Regeneration Allowable in the RCW HMA for AU-23 *

Guiding Document	Restoration to longleaf	Loblolly Regeneration	Total
Interim Standards and Guides	330	587	**905**
USFWS Recovery Plan	589	640	**1229**

*These are maximum allowable prior to foraging calculations

As the current overstory of loblolly pine continues to near or exceed its rotation age, it is essential that to have the flexibility to manage habitat in a manner that benefits the RCW in the long-term.

Paramount to restoration efforts is a need to provide good quality foraging habitat. Guidance for the current process to conduct foraging analyses comes from the 1989

USFWS Guidelines for Preparation of Biological Assessments and Evaluations for the Red-cockaded Woodpecker. Since this time, the USFWS has released new guidelines that are more comprehensive and account for the quality of the foraging habitat. These foraging guidelines are a part of the most recent Recovery Plan.

The purpose and need of this amendment is to update the Forest Plan to incorporate The Red-cockaded Woodpecker (*Picoides borealis)* Recovery Plan (Second Revision) as it applies to the Homochitto National Forest. In doing so, the guidance referenced in The Interim Standards and Guidelines for the Protection and Management of RCW Habitat within ¾ mile of Colony Sites as well as forest plan guidelines specific to RCW management will be replaced by updated strategies in the revised recovery plan.

The revised RCW Recovery Plan describes the primary actions needed to accomplish delisting and downlisting recovery goals: (1) application of frequent fire to both clusters and foraging habitat; (2) protection and development of large, mature pines throughout the landscape; (3) protection of existing cavities and judicious provisioning of artificial cavities; (4) provision of sufficient recruitment clusters in locations chosen to enhance the spatial arrangement of groups, and (5) restoration of sufficient habitat quality and quantity to support the large populations necessary for recovery.

The following table summarizes the existing references to guidance for the successful recovery and management of RCW populations and the changes needed to meet the desired condition.

Table 3.11 RCW Guidance needing change to meet the Desired Condition.

#	Existing Forest Plan Direction	Description	Amended Forest Plan Direction
1	1985 Forest Plan, Interim Standards and Guides by Amendment #8 and #14	General reference for source of RCW recovery guidance and silvicultural guidelines within the HMA	Reference most current RCW Recovery Plan. Use even-aged, two-aged, and/or uneven-aged management systems to restore off-site pine to native species in habitat managed for RCW. Limit regeneration (for restoration) size to 40 acres or less. Regeneration up to 80 acres for restoration when at least 1 mile from active or recruitment clusters.
2	1985 Forest Plan, pages 4-7, 4-8	Manage to attain a goal of four RCW colonies per 1,000 acres of suitable habitat.	Population size at delisting – 250 (PBG).

#	Existing Forest Plan Direction	Description	Amended Forest Plan Direction
4	1985 Forest Plan, #1, page 4-7	Manage longleaf pine working group on an 80-year rotation in each compartment.	Manage longleaf using rotation intervals not less than 120 years.
5	1985 Forest Plan, #1, page 4-7	Manage other pine working groups or their equivalent on a 70-year rotation.	Manage loblolly using rotation interval not less than 100 years. An exception to this for stands under high risk of mortality due to insects, disease, or other site related problems may be given on a case by case basis through consultation with USFWS.
6	1985 Forest Plan #2, Page 4-7 and Interim Standards and Guides	Provide at least 125 acres of foraging habitat 30 years old or older connected to and within ½-mile of all active colonies and replacement/recruitment stands. 40% of the acreage in each foraging area should be 60 years plus if available. Provide at least 6,350 pine stems ≥ 10" DBH and 8,490 ft² of pine BA within ½ mi. and contiguous with the colony site.	For site index ≥ 60, provide 120 acres of quality foraging habitat
			For site index < 60, provide 200 to 300 acres of foraging habitat – with some exceptions
			18 or more stems/acre ≥ 60 years old and ≥ 14 DBH, min. BA 20ft²
			Not separated by > 200 feet of non-foraging area (hardwood stand, water, regen. area)
			Must be within ½ mile of the center of the cluster
			Min. BA is 40 ft². For trees < 10" DBH, BA is < 10 ft². For trees 10-14" DBH, BA is between 0 and 40 ft²
			Hardwood midstory is sparse and < 7 ft. tall
			Ground vegetation of bunch grass or herbs > 40%
7	1985 Forest Plan, #3, page 4-7	Establish 10-acre replacement/recruitment	Provide a constant supply of unoccupied recruitment

#	Existing Forest Plan Direction	Description	Amended Forest Plan Direction
		stand for each existing colony and for each additional colony required to meet population objective. These stands should be at least 60 years old.	clusters equal to 10 percent of total active clusters in the population.
8	1985 Forest Plan, #4, page 4-7	The colony site and replacement/recruitment stand can be part of the foraging habitat if it meets the qualifications.	If recovery standard is not met, then assign each recruitment cluster at least 120 acres of foraging habitat that meets elements (b,c,d,f,g,h, and i), and additionally, stands should contain no more than 70ft²/ac basal area in total.
9	1985 Forest Plan, #5, page 4-7	Since the replacement stand is located within the foraging habitat of an existing colony, no additional foraging habitat needs to be provided.	NA

Direct/indirect effects - Effects of this alternative would be similar to the Proposed Action. Alternative 3 would provide the greater amount of foraging habitat, therefore minimizing the effects of the restoration cuts. Midstory removal would clear the underbrush, vines, and small woody vegetation in the midstory, leaving an open stand of well-spaced trees suitable for RCW foraging. This is usually done with the use of chainsaws, herbicides, or a combination of both. The installation of insert cavities can be considered a direct beneficial effect in that suitable cavities for RCW are created and maybe inhabited quickly.

Cumulative effects – Alternative 3 amends the current forest plan direction to incorporate the *Red-cockaded Woodpecker Recovery Plan, Second Revision*. By amending the plan, all future projects planned within the red-cockaded woodpecker HMA on the Homochitto National Forest, will comply with the direction in the recovery plan. This direction includes the level, distribution, and type of harvests allowed. Fish and Wildlife Service biologists will review the Biological Evaluations for all projects. In fact, direction, supported by the Fish and Wildlife Service, encourages restoration of longleaf, sufficient regeneration of other pine types to

maintain a steady flow of replacement habitats as pines in older stands are lost, and thinning for habitat improvements, pine beetle hazard reduction, and midstory control.

The other effects of this alternative would be similar to the Proposed Action. Over time, the implementation of more effective treatments for providing high quality habitat for RCW would be expected to increase the rate of its population growth, aiding in the attainment of population objectives for the Forest HMA. At the same time, habitat for species preferring a greater composition of within-stand hardwood may decrease or move into areas that continue to provide the needed habitat.
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3.2.4 Forest Sensitive Species

Affected Environment

Forest Service Sensitive species that occur on the Homochitto National Forest and which have apparently suitable habitat present in the analysis area are included in table 3.12

Table 3.12 Forest Service Sensitive Species

Species	Determination based on the Proposed Action, Alt 2	Determination based on Alternative 3	Determination based on the No Action Alternative
Webster's salamander	MII	MII	NI
Bald Eagle	NI	NI	NI
Bachman's sparrow	MII (short term)	MII (short term)	MII (long term)
Pearl blackwater crayfish	MII (short term)	MII (short term)	NI
Alabama shad	NI	NI	NI
Crystal darter	NI	NI	NI
Broadstripe topminnow	NI	NI	NI
Natchez stonefly	MII (short term)	MII (short term)	NI
Chukcho stonefly	MII (short term)	MII (short term)	NI
Rayed creekshell	NI	NI	NI
Rafinesque's big-eared bat	MII	MII	NI
Southeastern myotis	NI	NI	NI
Arogos skipper	MII (short term/long term beneficial)	MII (short term/long term beneficial)	NI (short term)
Trachyxiphium heteroicum (moss)	NI	NI	NI
Cypress-knee sedge	NI	NI	NI
Small's woodfern	NI	NI	NI
Bay starvine	MII	MII	NI
Carolina fluffgrass	MII	MII	NI
Fetid trillium	MII	MII	NI
Ravine sedge	MII	MII	NI

NI = No Impact
MII = May impact individuals but not likely to cause a trend to federal listing or a loss of viability
BI = Beneficial impact
L = Likely to result in a trend to federal listing or loss of viability

Alternative 1 – No Action

Direct/indirect effects – The "no action" Alternative 1 would result in environmental changes limited to biological processes, with the only management being prescribed burning and possibly mechanical midstory removal and insert installations for RCW's. Should future beetle infestations occur, salvage harvests may be implemented.

The "no action" alternative would not insure the disturbance regime necessary to provide diversity in the mixed-pine system. Burning alone has not been able to control the hardwood midstory, loblolly pine, and underbrush in the area. Some of the area remains thick with underbrush, has a high tree density, and is not moving toward the desired future conditions outlined in the Forest Plan and the RCW Recovery Plan. Those species preferring the open pine forests like Bachman's sparrow would benefit more from the alternatives that allow thinning and burning.

Cumulative effects – The only species which would have a negative cumulative effect would be the Bachman's sparrow. With no action, the midstory becomes denser and becomes of less value to the habitat requirements of the Bachman's Sparrow.

Alternative 2- Proposed Action

Direct/indirect effects **-** The proposed regeneration areas would create temporary openings. The forest canopy would be removed, except longleaf pines would remain, and riparian areas would not be disturbed. The vegetation within these open areas would change to woody sprouts and seedlings, herbaceous growth, and planted seedlings. Subsequent planting in areas where the stocking success is less than 300 trees per acre after the first growing season would allow for the adequate stocking of longleaf and loblolly pine. Species preferring the cutover brushy areas like Bachman's sparrow could benefit in the short term from these openings. Prescribed burning would benefit the species that prefer the grassy understory. Arogos skipper is another species that would benefit from the longleaf pine ecosystem restoration.

Bald eagles are generally limited to winter occupancy in Mississippi. The bald eagle is a large bird that generally occurs in the vicinity of lakes, rivers, and marshes and along seacoasts. Nesting usually occurs in areas with mature trees near large bodies of water. The diet of southeastern bald eagles is primarily fish, supplemented with reptiles, waterfowl, small mammals, and carrion (Mississippi Department of Wildlife, Fisheries and Parks, 1995). Although bald eagles winter and breed on St. Catherine's Creek National Wildlife Refuge (approximately 25 miles to the West of this Analysis Unit) and a couple of miles to the east at Okhissa Lake, no suitable habitat is known to occur in the project area, and this area is considered generally unsuitable habitat for the bald eagle.

A maximum of 1 ephemeral pond for every 100 acres is proposed within this alternative. This equals approximately 100 ponds to potentially be constructed within the analysis area. An average of 4 bat boxes may be installed at each ephemeral pond. Bat habitat may be affected by the alternative actions of mechanical disturbance and burning, causing some loss of den trees, but this is unlikely to occur because most den trees are in the riparian areas close to water channels.

The proposed action and all action alternatives focus management activities on ridges and specifically avoid streamside management zones and all wetlands. Therefore, the proposed action and all alternatives may impact individuals but will not likely result in a trend towards federal listing or a loss of viability for the bay starvine and the fetid trillium. The proposed action and all alternatives should have no effect on *Trachyxiphium* moss, cypress-knee sedge, and Small's wood fern since these species' habitat will be avoided during harvesting operations.

Cumulative effects – The on the ground action of the proposed action alternative does not contribute to the loss of viability of any Sensitive Species. Most species are associated with mesic conditions along drainages. A survey of likely locations was conducted and any populations located are being protected, even though a few individuals may suffer mechanical damage. By maintaining critical habitats, and protecting populations through proper mitigation, the potential for cumulative effects appears to be remote.

None of the alternatives described for this project will have a determination of "Likely to result in a trend to federal listing or loss of viability". The Bachman's sparrow and Arogos skipper both have a "may impact individuals" determination; however the proposed project would benefit both species in the long term by creating suitable habitat. The other species with a "may impact individuals" determination would only be impacted in the short term and impacts should be minimal.

Alternative 3

Direct/indirect effects - Effects of this alternative would be similar to the Proposed Action. Under the proposed forest plan amendment, most changes in effects are likely to occur primarily as a result of increased fire frequency within the RCW HMAs and increased emphasis on the use of growing season burns within RCW nesting and foraging habitat. Mid-story control of hardwoods and thinning in RCW foraging areas are also expected to influence sensitive species, but those effects are projected to be minimal.

Cumulative effects - Effects of this alternative would be similar to the Proposed Action.

3.2.5 State Local Concern Species

Affected Environment

The only animal that is a state species of local concern that potentially occurs in the project area is the hoary bat (*Lasiurus cinereus*). Hoary bats roost in the foliage of a variety of trees and therefore have a wide distribution. In general, the high densities of insects that can be found around bodies of water, such as streams and ponds, makes these very important foraging habitat for this species of bat. Surveys for these bats have not been conducted in the analysis area; however, the analysis area is known to contain habitat preferred by this bat species.

Alternative 1 – No Action

Direct/indirect effects – There could be disturbance to the hoary bat. However, remaining stands of trees should provide a continuous supply of habitat. No bat boxes will be established under this alternative.

Cumulative effects – There should be no negative cumulative effects associated with this alternative. Most foraging habitat is located within SMZ's which have a large supply of hardwood trees available for bat roosting.

Alternative 2- Proposed Action

Direct/indirect effects - A majority of the bat's foraging habitat (bodies of water) should remain undisturbed by the management activities in Analysis Unit 23 through the maintenance of SMZs. Hardwoods left in areas targeted for burning will slowly drop out of the stand, but in these areas hardwood inclusions and SMZs should remain intact. In areas to be thinned, the majority of trees that are 12 inches DBH and greater will be left, as well as all trees with cavities (wildlife trees). Therefore, a majority of roosting trees should remain intact within areas designated for management.

Cumulative effects – The hoary bat could potentially be disturbed during management activities. However, foraging and roosting habitats should, for the most part, remain intact by maintaining streamside management zones and hardwood inclusions. Most hardwood trees 12 inches or greater will not be cut and trees that have cavities (wildlife trees) will be left. If disturbance occurs during management activities, there is potential roosting habitat over most of the National Forest, which occurs adjacent too and is not isolated from the AU. The National Forest could potentially act as a refuge for this species of bat.

Alternative 3

Direct/indirect effects - Effects of this alternative would be similar to the Proposed Action.

Cumulative effects - Effects of this alternative would be similar to the Proposed Action. The proposed amendment to the Forest Plan would have no additional cumulative effects to the state local concern species.

3.2.6 Management Indicator Species

Affected Environment

Terrestrial Species: Under the 1976 National Forest Management Act (NFMA), the Forest Service is charged with managing National Forests to provide for a diversity of plant and animal communities consistent with multiple-use objectives. Management Indicator Species (MIS) are one tool used to accomplish this objective. MIS and their habitat needs are used to set management objectives and minimum management requirements to focus effects analysis, and to monitor effects of plan implementation. MIS were selected in the 1985 Land and Resource Management Plan to serve three major functions: 1) represent issues of hunting demand, 2) consider species for which population viability may be a concern, and 3) consider species that serve as ecological indicators of certain communities or habitats. In this analysis, MIS affected by the project are used to focus analysis of effects of this project on these issues.

Available Management Indicator Species information has been compiled and consolidated to provide as clear a picture as possible of how indicator species have responded to management activities or the absence of such activities. The most current MIS report is dated March 2005. Information from this report, along with additional information available to the Interdisciplinary Team, is summarized below and used to assist the responsible official in reaching a decision.

NFMA intends use of management indicator species, in part, 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 al. 1988), new strategies are emerging for accomplishing this goal. One strategy is the coarse and fine filter approach (Nature Conservancy 1982, Noss 1987). 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. Management Indicator Species (MIS) for terrestrial habitats were selected as provided in Section 6, 219.12(g)(2) of the National Forest Management Act (1976), planning regulations. The species and the habitats represented by them are presented in Table 3.13. Rufous-sided towhee and hooded

warbler were not considered further in the analysis because none of the alternatives had any impact on the specific habitats they were selected to represent.

White-tailed deer were selected in the forest plan as an MIS of the young (0-10years) age class for all forest types. As a browsing herbivore, the white-tailed deer would benefit from thinning and regeneration acres in the action alternatives. An increase in grass, forbs, shrubs, and sprouts will result from the increased sunlight to the forest floor. Relative amounts of browse production from planned activities would vary by site-specific prescription but would generally be greatest for those stands scheduled for regeneration and least for those stands where no thinning, midstory control, or regeneration would occur. The March, 2005 Report on MIS evaluated white-tailed deer habitat as exhibiting decrease on the Homochitto.

Bachman's sparrow was selected in the forest plan as an MIS to represent early seral pine stands. The species also occurs in mature pine stands with a grass and herbaceous forest floor groundcover. Bachman's sparrow would benefit from thinning and prescribed burning, as well as regeneration areas. The March, 2005 Report on MIS evaluated Bachman's sparrows habitat as exhibiting an increase on the Homochitto, while population growth is showing a region wide decline.

Table 3.13 MIS and Represented Habitats

Management Indicator Species	Habitats Represented	Considered in Analysis
White-tailed deer	0-10 years, all forest types	Yes
Bachman's sparrow	0-10 years, longleaf/mod. yield slash pine	Yes*
Bobwhite quail	0-10 years, longleaf/yellow pine	Yes*
Eastern meadowlark	0-10 years, yellow pine	Yes
American kestrel	0-10 years, pine/hardwood	Yes
Rufous-sided towhee	0-10 years, hardwood	No
Eastern wild turkey	40+ years, all forest types	Yes
Pileated woodpecker	40+ years, all forest types	Yes
Red-cockaded woodpecker	40+ years, all pine forests except slash	Yes*
Fox squirrel	40+ years, longleaf pine	Yes
Pine warbler	40+ years, yellow pine	Yes
Eastern gray squirrel	40+ years, pine/hardwood and hardwood	Yes
Screech owl	40+ years, pine/hardwood	Yes
Hooded warbler	40+ years, hardwood	Yes

* The original Forest Plan did not acknowledge the presence of Longleaf Pine on the Homochitto District. Longleaf occurs on the Homochitto primarily in mixed stands with shortleaf and loblolly. The MIS indicators for Longleaf forest are used here to represent these mixed pine stands which are the functional equivalent of Longleaf forest elsewhere

Northern bobwhite quail are MIS selected in the Land Management Plan to represent all early seral (0-10 years old yellow pine) stages. Bobwhite, like Bachman's sparrows, can also occur in mature pine stands with a grass and herbaceous forest floor. The greatest benefit for this species would be in regeneration areas and also in stand where there is planned thinning. The March 2005 Report of MIS, evaluated the amount of bobwhite quail habitat on the Homochitto as declining, while population growth trends remain stable.

The eastern meadowlark was selected in the forest plan as representing early age yellow pine. It has, however, not proven to be a very useful MIS for the National Forests in Mississippi. It was noted in the forest plan that this species occurred primarily in open farmlands, but was thought to be found in cleared, grassy areas such as what would be created during forest regeneration. Analysis of the breeding bird census indicates that this survey is not detecting the eastern meadowlark in habitats within the National Forests. Deviation from the expected plan may reflect the fact that the eastern meadowlark is a true grassland bird and forest regeneration areas are too small, too ephemeral, or too forest-like to provide this species' habitat. The March 2005 Report of MIS evaluated the amount eastern meadowlark habitat on the Homochitto and found it steadily declining, which helps explain a declining population growth.

The American kestrel is a temperate migrant that breeds and winters in Mississippi. It is a bird of open country and woodland margins and breeds in snag cavities which have been excavated by previous birds. It was selected in the forest plan to represent species which utilize early-age mixed pine-hardwood. The March 2005 Report of MIS evaluated American kestrel habitat has a declining trend on the Homochitto, while population growth remains stable range wide.

The eastern wild turkey was selected in the forest plan to represent the later succession habitat type (40+ year old stands, all forest types). Preferred habitat has dropped approximately 25,000 acres since 1981 due to plan implementation. The March 2005 Report of MIS evaluated the amount wild turkey habitat on the Homochitto and found it steadily decreasing, which could explain its downward population trend.

The pileated woodpecker was selected in the forest plan as an indicator of older forests (40 year old and older forests, all forest types). The March 2005 Report of MIS evaluated the amount of pileated woodpecker habitat on the Homochitto and found it steadily decreasing, as the population range wide is increasing.

RCW was selected in the forest plan as representing older (40 year old and older) pine stands. It is also an endangered species and was discussed in the BE for AU 23. The March 2005 Report on MIS evaluated RCW populations as increasing where the habitat is managed to enhance conditions for this species.

Fox squirrels were selected in the forest plan as indicator species for 40 year old and older age class longleaf pine stands. Fox squirrels are also found in loblolly pine areas and in the transition zones between pines and hardwoods. The eastern gray squirrel is a

MIS for 40 year old and older pine/hardwood and hardwood forests. The March 2005 Report on MIS evaluated gray squirrels as having very little preferred habitat on the Homochitto. Data suggest that squirrel populations are adequately supporting hunter demand and suitable habitats are increasing.

The pine warbler was selected in the forest plan as an MIS representing 40 year old and older yellow pine. The March 2005 Report of MIS evaluated the amount of pine warbler habitat on the Homochitto and found it steadily decreasing, as the population range wide is increasing.

The Rufous-sided or eastern towhee was used in the forest plan to represent hardwood forest stands in the 0 to 10 year age class. It utilizes brushy and edge habitat. The March 2005 Report of MIS evaluated the amount of eastern towhee habitat on the Homochitto; and found it steadily decreasing as the population remains stable.

Hooded warblers were used in the forest plan to indicate shrub components of mature hardwood forests. The March 2005 Report of MIS evaluated the amount hooded warbler habitat on the Homochitto and found it steadily increasing, as the population range remains stable to slightly increasing.

Screech Owls were used to indicate those species depending on cavities and small vertebrates in late seral stage (40+ year old) pine-hardwood forest. The March 2005 Report of MIS evaluated the amount eastern screech owl habitat on the Homochitto and found it steadily increasing, as the population range wide is increasing.

Aquatic MIS: Streams on the Homochitto National Forest are characteristically slow flowing, clear, warm, sand-gravel bottom, 1st – 3rd order streams. These streams are moderately shaded, wide and shallow with low conductivity and with an acid pH. The species of fish selected as Management Indicator Species for Southwest Mississippi Streams represent an assemblage of fish from all trophic levels. Lampreys, darters, and madtoms require very good water quality and low turbidity and are rarely found in degraded habitats. Spotted bass are the major carnivore in the system and with the longear sunfish comprise the major game species. The blacktail redhorse, longnose shiner, and bluntface shiner are significant forage species in the system. In contrast to terrestrial MIS, which were to represent changes in habitat (the conversion of acres of late seral forest into early seral forest), the aquatic MIS serve to indicate changes in water quality, not quantity of habitat. Table 3.14 lists the fish MIS associated with the Homochitto National Forest.

Table 3.14 Common and scientific names of MIS fish

Common Name	Scientific Name
spotted bass	*Micropterus punctulatus*
rainbow darter	*Etheostoma caeruleum*
brighteye darter	*Etheostoma lynceum*
brindled madtom	*Noturus miurus*
longnose shiner	*Notropis longirostris*
bluntface shiner	*Notropis camurus (Cyprinella camura)*
blacktail redhorse	*Moxostoma poecilurum*
southern brook lamprey	*Ichthyomyzon gagei*

Streams on the National Forests in Mississippi have been surveyed using a variety of methods since adoption of the Forest Plan. Surveys by Forest Service personnel have been supplemented by inventories conducted by area universities. Based on reviews of existing data, a more comprehensive stream survey program was begun in 1999, using consistent methodology. Fish species are highly sensitive to flow rates and water temperature, with respect to their seasonal locations within streams. Because of differences in size and flow rates, not all streams have habitat to support the full range of management indicator fish species. The expectation is highly variable samples over time, with multiple surveys required to establish the full range of species inhabiting a stream. Primary fishing lakes on the National Forests in Mississippi have been monitored by Forest Service and Mississippi State University personnel using electro-fishing techniques since 1987. Data on numbers, sizes, and condition of fish are recorded and analyzed. Data from all these sources are used to assess distribution and relative abundance of stream MIS (MIS Report, p. 12).

Additional sampling was conducted on selected streams during 1996 as part of an on-going Forest Service study of the fish fauna of the Homochitto National Forest. Both diversity and species richness were reported as high and the Index of Biotic Integrity (IBI) characterized the streams of the forest as generally "good" to "excellent" (Johnston and McWhirter, 1996). It was confirmed by both studies that all eight of the aquatic Management Indicator Species occurred on the Homochitto National Forest. Streams on the Homochitto National Forest are, for the most part restricted to the Homochitto River drainage, with relatively small acreages in the Amite, Bayou Pierre, and Buffalo drainages. Because of the relative homogeneity of these streams, the stream fauna throughout the forest consists of the same suites of species in the same habitat from one stream to another. Streams within Analysis Unit 23 are included in the Foster Creek drainages. This stream flows into the Homochitto River.

Alternative 1 – No Action

Direct/indirect effects **–** A comparison of alternative affects to the management indicator species community is based on the habitat disturbance from the actions proposed and is shown in the table below.

Table 3.15. Comparison of the estimated MIS community acreage affected by the proposed actions for each alternative.

Management Indicator Species	Habitats	Alt. 1	Alt. 2	Alt. 3
White-tailed deer	0-10 years, all forest types*	0 acres	782 acres	570 acres
Bachman's sparrow	0-10 years, longleaf/mod. yield slash pine*	0	342 acres	396 acres
Bobwhite quail	0-10 years, longleaf/yellow pine*	0 acres	782 acres	570 acres
Eastern meadowlark	0-10 years, yellow pine*	0 acres	440 acres	174 acres
American kestrel	0-10 years, pine/hardwood	0 acres	0 acres	0 acres
Rufous-sided towhee	0-10 years, hardwood	0	0	0
Eastern wild turkey	40+ years, all forest types	3071 acres	2738 acres	2284 acres
Pileated woodpecker	40+ years, all forest types	3071 acres	2738 acres	2284 acres
Red-cockaded woodpecker	40+ years, all pine forests except slash	2464 acres	2166 acres	1699 acres
Fox squirrel	40+ years, longleaf pine	235 acres	235 acres	235 acres
Pine warbler	40+ years, yellow pine	1983 acres	1931 acres	1466 acres
Eastern gray squirrel	40+ years, pine/hardwood and hardwood	701 acre	576 acres	586 acres
Screech owl	40+ years, pine/hardwood	364 acres	475 acres	449 acres
Hooded warbler	40+ years, hardwood	160 acres	160 acres	160 acres

*Represent habitat created from proposed actions

Under the “no action” alternative the proposed actions would not occur. The effects to fish or wildlife MIS would be those occurring from other projects (i.e. prescribed burning) and natural processes such as trees dying, trees falling, decaying leaf matter, etc. There would be no timber activity except for those acres proposed in the 2005 1st Thinning Project. There would be no chance of an individual nest of songbird being crushed. Indirectly, this alternative would not provide young age classes of timber (early successional habitat). All trees under this alternative would grow older across the analysis area. The standing crop of preferred woody browse for deer would be fairly low across the analysis area. There would be no harvesting activities that could benefit Bachman’s sparrow. There would be no management (recruitment stands, thinning) for RCW. Habitat for pileated woodpeckers would increase under this alternative, as dead trees would increase.

Cumulative effects - The lack of regeneration in this analysis unit will have a serious effect on the age class distribution. There will be some negative cumulative effects as early seral species depending on this type of habitat will begin to decline within this analysis unit as older stand habitat begins to increase.

Alternative 2- Proposed Action

Direct/indirect effects - Those species preferring the open pine forests (i.e. pileated woodpecker, fox squirrel, and red-cockaded woodpecker) would benefit most from the thinning and prescribed burning. These treatments would open the canopy, reduce tree density, reduce brush, and provide a more diverse grassy, herbaceous understory, which would provide more suitable habitat for these species. All alternatives offer the same prescribed burning acreage to be treated; therefore, no differences would occur between alternatives for prescribed burning.

Those species preferring the early successional habitats (i.e., white-tailed deer, Bachman's sparrow, and bobwhite quail) would benefit most from the regeneration harvests. These regeneration areas would create small clearcut patches with retention of scattered existing longleaf pine (restoration areas) and yellow pine (shelterwod areas) supplying a dynamic mosaic of different successional stages of suitable habitat (relatively dense, low vegetation with little or no tree canopy). These early successional habitat species can utilize recently cut areas for berries, other soft mast, and insects common in these areas. Prescribed site prep burns would follow harvesting, which would kill or retard woody and hardwood sprouts while stimulating the growth of grasses and forbs.

Hardwood stands, hardwood inclusions within pine stands, and the retention of hardwoods along streamside zones would be beneficial to pileated woodpeckers, turkeys, and other species that utilized hardwood trees.

No affects to aquatic MIS would be expected because riparian habitat would be protected during project implementation through protective measures as mentioned earlier. Risk to aquatic species would be minimized do to protective measures limiting timber harvesting, site preparation, herbicide use, and other management activities within riparian areas. Implementing best management practices within streamside zones during harvesting would minimize any affect to the degree that no effect would be expected to aquatic MIS. No herbicide application within 30 feet of water would prevent harmful effects to fish.

Cumulative effects – The regeneration planned in the Proposed Action will benefit Management Indicator Species associated with early seral and edge habitat. Sawtimber thinning stands will benefit those species which utilize older open stands. Habitat will swing from older 40+ stands to young early seral stages with regeneration. The proposed action will help balance the age class distribution. As a result, there is not expected to be any negative cumulative impacts to MIS as a whole. MIS surveys have

confirmed the effectiveness of standard mitigation measures, and no cumulative effects to water quality or aquatic MIS species are expected from this project.

Alternative 3

Direct/Indirect effects - Effects of this alternative would be similar to the Proposed Action. In general, under the proposed forest plan amendment, most changes in effects are likely to occur primarily as a result of increased fire frequency within the RCW HMAs and increased emphasis on the use of growing season burns within RCW nesting and foraging habitat. Mid-story control of hardwoods and thinning in RCW foraging areas are also expected to influence sensitive species, but those effects are projected to be minimal.

Many sensitive and conservation species occurring within the Forest are located within habitats conducive to fire. Prescribed fire could damage or kill some individual plants of these species; however, these impacts would be slight and the overall impacts to the species population would be beneficial. Prescribed burning would decrease competition from fire intolerant species, provide more fertile seedbeds, and return valuable nutrients to the soils more rapidly.

Some sensitive and conservation species are found in habitats not normally influenced by fire. The extent of impacts to individual plants and root systems of these species would be determined by the time, frequency, and intensity of the prescribed fires. Aerial portions of the plants, shallow root systems, and exposed seeds could be damaged or killed by prescribed fire. However, these impacts to the population as a whole would be minor and would not cause a trend to Federal listing or loss of viability of the species. A more detailed analysis of these species and the likely effects are provided in the attached BE.

Cumulative effects - Effects of this alternative would be similar to the Proposed Action. Habitat and population of MIS and most other forest species is expected to benefit from this alternative over time.

3.2.7 Migratory Bird

Affected Environment

Under the National Forest Management Act (NFMA), the Forest Service is directed to "provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives." (P.L. 94-588, Sec 6 (g) (3) (B)). The January 2000 USDA Forest Service (FS) Landbird Conservation Strategic Plan, followed by Executive Order 13186 in 2001, in addition to the Partners in Flight (PIF) specific habitat Conservation Plans for birds, and the January 2004 PIF North American Landbird Conservation Plan, all reference

goals and objectives for integrating bird conservation into forest management and planning.

A program for monitoring land bird populations in the southern region has been developed. It involves establishing several thousand permanent monitoring stations on National Forests across the South, covering all major physiographic regions and habitat types. Each point is visited yearly using standard procedures to record all birds present. On the Homochitto National Forest, 240 points have been monitored since 1994. The resulting data resides in a Regional database (R8Bird). Results of a regional analysis of this data have been published (La Sorte, et al. 2007).

In late 2008, a *Memorandum of Understanding between the USDA Forest Service and the US Fish and Wildlife Service to Promote the Conservation of Migratory Birds* was signed. The intent of the MOU is to strengthen migratory bird conservation through enhanced collaboration and cooperation between the Forest Service and the Fish and Wildlife Service as well as other federal, state, tribal and local governments. Within the National Forests, conservation of migratory birds focuses on providing a diversity of habitat conditions at multiple spatial scales and ensuring that bird conservation is addressed when planning for land management activities.

The Homochitto National Forest is proposing to manage lands located in AU 23. Proposed management is intended to implement direction contained within the National Forests in Mississippi Land and Resource Management Plan (LRMP, USFS 1985). Potential risks resulting from management actions were assessed by referring to available occurrence records and to information on the general biology of select species obtained from survey reports and scientific literature. Likely impacts to select TES birds and their habitats have been analyzed in the project BE.

Alternative 1 – No Action

Direct/Indirect effects- There will be no direct effects to game species with this alternative. No mechanical equipment would be used in this alternative. No early seral stage habitat will become available under this alternative.

Cumulative effects - The project area will continue in its present loblolly pine forest cover until natural processes such as insects, disease, wind damage, or wildfire remove the current canopy. Without a native seed source and suppression of seeding by loblolly pine remaining around the natural opening, there is no chance for the restoration of longleaf pine to the site. Hardwoods such as sweetgum would continue to occupy mid-canopy space in the forest and reduce crown development of oaks that are present.

Alternative 2- Proposed Action

Direct/Indirect effects*/Cumulative*- A high priority in the south is to restore and maintain natural ecosystems that have been substantially reduced or altered such as the longleaf pine system (Dickson, Franzerb, Thompson and Conner 1992). Failure to accomplish maintenance and restoration of scarce habitat types is more likely to impact population trends than the short-term disturbance created by logging activities. According to Dr. Wes Burger of Mississippi State University, this type of management actually constitutes "ecosystem management" or "restoration" from which many early succession, fire adapted species such as the Bachman's sparrow, prairie warbler, and northern bobwhite likely benefit (Lucas 1993, Wilson et al. 1995).

According to management recommendations provided by Dickson, Franzerb, Thompson and Conner (1992), neotropical bird communities are determined by local habitat factors as well as landscape composition. At a landscape level, the single most important consideration is to maintain large areas in breeding and wintering forest habitats to provide for large neotropical populations. At the habitat level, the most basic management step is to maintain native ecosystems and promote rare ecosystems required by threatened, endangered and regional species of high management concern.

Under the AU 23 proposal, the total acres which will be either thinned or regenerated represents approximately 1% of the total Homochitto National Forest area. Though the proposed action may have short-term adverse effects (i.e. disturbance, nest lost) for select migratory landbird species, these effects would generally be short lived. In order to maintain and restore habitat on a landscape level we must incorporate a balance between possible short-term losses and long-term benefits for the species and their associated habitats. Our landbird monitoring program documents species occurrence and allows us to monitor population trends. Our Biological Evaluation serves as further analysis in instances where species viability may be of more immediate concern.

Potential impacts to migratory species would be minimized through the adherence of LRMP Standards and Guidelines for snags/down woody debris, riparian reserve buffers, and ground disturbance. Specific project design criteria include the following: within the streamside management zone canopy closure will be maintained at 60-70% or greater, ground disturbance will be limited to 15% or less, vegetation species diversity and composition will be maintained; no management will occur in designated riparian reserves, and snags and downed logs would be retained on site. Any snag felled for safety reasons will be left on site as downed woody debris. Additional cull logs will be left on site from the logging operation as well. All riparian reserves within the project were identified and buffers established. In addition, no operations will occur when unsuitable moisture conditions exist.

Alternative 3

Direct/Indirect effects - Effects of this alternative would be similar to the Proposed Action.

Cumulative effects - Effects of this alternative would be similar to the Proposed Action. The proposed amendment to the Forest Plan would have no additional cumulative effects to the migratory birds.

3.2.8 Public Demand Species

Affected Environment

Primary game species within the project area include deer, turkey, quail and squirrel. Management of these game species is the responsibility of the state Department of Wildlife, Fisheries and Parks with the U.S. Forest Service taking a secondary role. To the extent that the populations respond to habitat management, the Forest Service can impact species abundance. Factors limiting population levels of these species include, but are not limited to hunting pressure, predators, and limited availability of suitable habitat. Other factors such as changes in hunting regulations can have as great an effect for some species such as whitetail deer and wild turkey.

The annual *Management Indicator Species Population and Habitat Trends, National Forest in Mississippi* (March 2005) showed estimated FY 2003 harvest population results on the Homochitto District for the following game species:

	2003
White-tailed deer (harvest/year)	900
Wild turkey (harvest/year)	230
Fox squirrel & gray squirrel (harvest/year)	2000
Bobwhite quail (harvest/year)	60

Population levels for game species range from stable to declining. White-tailed populations appear to be decreasing but recreational hunting opportunities remain available and are of high quality. This outcome is apparent despite declines in early-seral habitat. Wild turkey populations show a downward trend. Bobwhite populations are low region-wide. Populations of squirrels remain stable and support quality recreational hunting. It is assumed that a contributing factor to the downward trends in some populations is the reduction in size to the Caston Creek Wildlife Management Area in 1994. (MIS Report)

Alternative 1 – No Action

Direct/Indirect effects- There will be no direct effects to game species with this alternative. No mechanical equipment would be used in this alternative. No early seral stage habitat will become available under this alternative.

Cumulative effects - The project area will continue in its present loblolly pine forest cover until natural processes such as insects, disease, wind damage, or wildfire remove

the current canopy. Without a native seed source and suppression of seeding by loblolly pine remaining around the natural opening, there is no chance for the restoration of longleaf pine to the site. Hardwoods such as sweetgum would continue to occupy mid-canopy space in the forest and reduce crown development of oaks that are present.

Alternative 2- Proposed Action

Direct/Indirect effects - Under this alternative, thinning treatments would open the forest canopy and stimulate the growth of grasses and forbs that are essential for the eastern wild turkey. With increased sunlight, the understory species would provide nesting and foraging habitat for the turkey.

Thinning and the prescribed site prep burns would increase the quantity of legumes and browse for the white-tailed deer. Ground cover quantity and quality would be improved due the opening of the forest canopy. White-tailed deer generally benefit from even-aged regeneration methods, and would gain some advantages from the restoration cutting. The herbaceous and woody stem production after the cutting provides high quality food source, good gnawing cover, and valuable bedding and protection cover. The use of chemical site preparation followed by burning would reduce the amount of time this habitat would remain suitable. Chemical or mechanical release work would remove this food source, also. Gray and fox squirrels would not be affected by these alternatives.

Cumulative effects- By maintaining the bulk of mast producing hardwoods in the regeneration and thinning areas, increasing the quality of those hardwoods through release, incorporation of clumps and single trees within regeneration areas, incorporation of streamside management zones, and other mitigations discussed, there should be no net loss of hardwood mast producers in Analysis Unit 23.

Management focuses on benefits to the games species involved, not on the concept of hardwood itself. Regeneration of mature loblolly pine stands and thinning of such stands may in fact be partial mitigation for deer, turkey, and quail since each of these species benefits from at least some exposure to early seral stages at some point in their life history. The whitetail deer is a habitat generalist and browser who do not care where the young, tender woody vegetation comes from to browse. The wild turkey needs accessibility to early seral habitat for nesting and brood habitat even though the turkey will utilize acorns if available; acorns are not essential to its survival. The bobwhite quail essentially disappears from un-thinned late seral stands that are not burned and will utilize regeneration areas for nesting and brooding until the rough becomes too difficult to move through.

Desired conditions described in the Forest Plan include an increase in habitat capability for species dependent on early-seral conditions such as deer, and a decrease in habitat capability for late seral species such as turkey (page 4-82, Forest Plan). Harvest data for deer and turkey support the conclusion that Forest Plan goals related to habitat

capability are being met. In contrast, quail, another early-seral indicator, appear to exhibit stable populations, while squirrels, indicators of late-seral habitat, appear to exhibit populations which are stable but highly variable depending on the annual mast crop. These variable results reflect the variety of species-specific factors other than habitat that affects wildlife populations. For turkeys, such factors include disease, nest predation, weather pattern fluctuations, and hunting pressure. For quail, researchers have proposed weather, fire ants, land use changes, and predation as some of the potential factors causing region-wide declines in populations. The complexity of such specific ecological interactions associated with each species limits the usefulness of indicator species as representatives of other species or communities.

Alternative 3

Direct/Indirect effects - Effects of this alternative would be similar to the Proposed Action.

Cumulative effects - Effects of this alternative would be similar to the Proposed Action. The proposed amendment to the Forest Plan would have no additional cumulative effects to the migratory birds.

3.3 Social/Economic Environment

3.3.1 Economics

Affected Environment

The seven counties in southwest Mississippi contained within the Homochitto National Forest are Adams, Amite, Copiah, Franklin, Jefferson, Lincoln and Wilkinson. With the exception of Brookhaven and Natchez, these counties are rural in nature and are dominated by small towns. The seven counties are almost entirely dependent upon the timber, oil and gas industries. Within the proclamation boundary of the Homochitto National Forest, only 191,571 of the 373,497 acres (51%) are in federal ownership. The remainder is privately owned farms scattered along the Homochitto River, larger drains, and broader ridges, or interspersed forested tracts of industrial and private ownership. The ownership pattern becomes more broken north of U.S. Highway 84 in Franklin, Copiah, Jefferson, and Lincoln counties. The analysis area contains approximately 10,021 acres of National Forest land and approximately 4,039 acres of private land for a total of approximately 14,060 acres within Amite and Franklin counties. Private land use within close proximity to the project area is predominately timberland. There are some scattered parcels of private land currently utilized as cropland or pasture but the dominate use is timberland.

Timber production is an important base of the local economy. Local communities benefit from the taxes generated by timber activities. These benefits include social services such as law enforcement activities, safe drinking water, road maintenance,

construction and reconstruction of roads and public school systems. These services contribute to an enhanced standard of living to the public living within the area.

On May 23, 1908 Congress signed into law the "Twenty-Five Percent Fund Act of 1908" (Public Law 60-136; 16 U.S.C. 500, 533, and 556d) that requires the Forest Service to pay 25% of all timber sale proceeds to the States. From 1908 until the late 1980's this "Revenue Sharing" system worked well for forest counties and schools by providing a steady and significant income stream. By the late 1980's national environmental laws and aggressive environmental organizations caused most National Forests to discontinue or drastically cut grazing, timber management, and mining. As a result, U.S. Forest Service revenues declined very rapidly as did the 25% Forest Revenue receipts to counties and schools. By 1998 these revenues had declined by over 70%.

To addresses the decline in revenue from timber harvest in recent years received on Federal land, which have historically been shared with counties; on October 30, 2000, Congress signed into law the "Secure Rural School and Community Self-Determination Act of 2000", commonly known as Payments to States (Public Law 106-393). These funds have been used for schools and roads. For each year 2001-2006, the law allows counties to receive a payment from the Federal government based on the State average of their top three years of payments from Federal lands. The Act was extended until September 2011.

The purpose of the Act is to stabilize payments to counties that help support roads and schools, provide projects that enhance forest ecosystem health and provide employment opportunities, and to improve cooperative relationships among federal land management agencies and those who use and care about the lands the agencies manage. In 2007, money in the form of stabilized payments for Amite and Franklin Counties totaled $376,362.24 and $1,300,543.23 respectively.

Table 3.16: Payments to Counties, 2007

County	Full payment base amount	Title I %	Title I Public Law 106-393	Title II %	Title II public lands 106-393	Title III %	Title III County 106-203
Adams	$103,296.61	85	$87,802.12	0	$0.00	15	$15,494.49
Amite	$376,362.24	85	$319,907.90	13	$47,986.19	2	$8468.15
Copiah	$92,359.28	100	$92,359.28	0	$0.00	0	$0.00
Franklin	$1,300,543.24,	85	$1,105,461.75	15	$195,081.49	0	$0.00
Jefferson	$159,691.59	85	$135,737.85	0	$0.00	15	$23,953.74
Lincoln	$73,283.28	100	$73,283.28	0	$0.00	0	$0.00
Wilkinson	$369,010.20	85	$313,658.67	0	$29,520.82	7	$25,830.71
Homochitto National Forest Total	**$1,174,003.20**		**$2,128,210.85**		**$272,588.50**		**$73,747.09**
National Forests in Mississippi Total	**$8,362,187.26**		**$7,214,436.20**		**$656,449.08**		**$491,301.98**

Source: http://wwwnotes.fs.fed.us/r4/payments_to_states.nsf

Timber on the Homochitto National Forest represents an investment value for the public, which provides tax support during the long period of stand establishment and growth. Recently, pine sawtimber has brought nearly $44 per CCF, and pine pulpwood prices are currently about $5.00 per CCF.

Table 3.17 Economic Efficiency on the forest product revenues generated by alternatives

	No Action	Proposed Action	Modified Action
Timber Volume	0 CCF	66,982 CCF	51,542 CCF
Present Value	n/a	$1,519,976	$1,169,607
Engineering Costs	n/a	$69,000	$63,000
SAI Costs	n/a	$388,375	$381,208
Sale Admin Costs	n/a	$401,892	$309,252
Sale Prep	n/a	$535,856	$412,336
Present Value of Costs	n/a	$1,404,602	$1,150737
Present Net Value	n/a	$25,916	$18,867

Alternative 1 – No Action

Direct/Indirect effects- The implementation of this alternative would not generate jobs or revenue for local contractors, loggers, or businesses. Revenue from timber harvesting sales would not be generated. Revenues from these sales are used in other areas on the National Forest System, such as prescribed burning, the improvement of RCW habitat and recreation projects. The no action alternative would lower KV funds for wildlife habitat needs.

Cumulative effects- The loss of KV funds from timber sale receipts will reduce the amount of habitat improvement that can be done for wildlife, especially for the RCW, a federally endangered species.

Alternative 2 – Proposed Action

Direct/Indirect effects- the implementation of the management actions would provide economic benefits by providing jobs to the local and surrounding communities. Local timber companies would obtain a return on their investment, which in turn creates more jobs, and more dollar flow within the community.

The Proposed Action shows a PNV of $25,916 generated by the project. As of 7/14/10, pine sawtimber sold for $44.00/CCF. Hardwood sawtimber averages approximately $5.00/CCF. These figures reflect an average from several timber sales recently sold on the Homochitto National Forest.

Cumulative effects- Revenue generated from the sale of the forest's natural resources would be available for use in the funding of future projects and for making the 25% payments to surrounding counties. Implementing this alternative would contribute approximately $379,994 to the amount paid to counties from harvest activities on the Homochitto National Forest.

The management practices associated with these actions does not have a disproportionately high and adverse effect on the human health or the environment of minority or low-income populations.

Alternative 3

Direct/Indirect effects The Preferred Alternative shows a PNV of $18,897 generated by the project. Implementing this alternative would contribute approximately $292,401 to the amount paid to counties from harvest activities on the Homochitto National Forest. This alternative would provide less financial benefit to the counties than the Proposed Action in this entry, but could result in a greater return over time.

Cumulative effects- Under the proposed Forest Plan amendment, the allowance of regeneration openings up to 40 acres within ½ mile of an active or recruitment cluster or 80 acres if restoring native pine habitat beyond 1 mile of active or recruitment clusters within the HMAs, could potentially increase the output of timber. The potential increase of timber outputs under the proposed Forest Plan amendment will provide increased revenues paid to counties.

The management practices associated with these actions does not have a disproportionately high and adverse effect on the human health or the environment of minority or low-income populations.

3.3.2 Recreation

Affected Environment

The majority of recreation use on the Homochitto NF is dispersed recreation. Consisting mainly of hunting, hiking, bike riding, bird watching, and driving for pleasure. There are two developed recreation areas on the Homochitto NF: Clear Springs Recreation Area and Woodman Springs shooting range. The Clear Springs facility offers activities such as swimming, fishing, picnicking, camping, hiking, and other amenities. This facility is located outside of the project area. Woodman Springs shooting range is located three miles north of Gloster, MS on U.S. Highway 33 in compartment 259. Woodman Springs is mostly used during the weekends and is open from sun-up to sundown. This facility is located within the project area. There are approximately 31 miles of trails throughout the Homochitto NF. They include the Clear Springs Trail (1 mile), the Brushy Creek Horse Trail (5.5 miles), the Mill's Branch Trail (4.7 miles), the Tally's Creek Trail (11.7), the Richardson Creek Trail (6.9 miles), and the Nature Trail (0.5 miles). None of these areas are within the project area.

The Homochitto NF contains two state administered wildlife management areas, Caston Creek (27,785 acres) and Sandy Creek (16,400 acres) Wildlife Management Areas. These are operated on National Forest lands under a cooperative agreement between the Forest Service and the Mississippi Department of Wildlife, Fisheries, and Parks. The wildlife is managed by the state, and the Forest Service manages the habitat. The project area is not located within or adjacent to either wildlife management areas.

The Forest has been inventoried under the Recreation Opportunity Spectrum (ROS) system. This system is designed to inventory and manage land by level and type of recreational settings offered (Forest Plan, pg.4-41). The ROS identifies the area within Analysis Unit 23 as "Roaded Natural" which indicates a natural setting with obvious changes within the area, but not obvious from roads (FEIS-LRMP, pg. 3-16).

Along with ROS classification, the Forest Plan designated visual quality objectives (VOQ) throughout the forest. According to the Forest Plan, the Forest Management Goals (Forest Plan, pg.4-1 and 4-2) are to provide visually acceptable landscape by maintaining or upgrading the existing visual condition. The forest- wide standards and guidelines state that the Visual Resource Management relationship to visual quality includes systematic recognition that such values exist to varying degrees and can be protected and managed in conjunction with other National Forest resources. The VQO's with their description and acres affected within the project area are shown in the table below.

3.18 Visual Quality Objective acres in AU 23.

VQO	Description	Acres in AU
Preservation	Provides for ecological change only	0
Retention	Man's activities are not present	0
Partial Retention	Man's activities may be evident, but subordinate	398
Modification	Man's activities may be dominate but appear natural in foreground	146
Maximum Modification	Man's activities may be dominate but appear natural in background	5009

Alternative 1- No Action

Direct/Indirect effects- Under the no-action alternative present conditions would persist. In areas that continue to be prescribed burned on a regular basis dispersed recreation such as hunting, hiking, and horseback riding would continue at the current level. Over time areas needing burning, midstory removal or first thinning may become too dense to the casual user. These areas are more susceptible to complete destruction from wildfire.

Cumulative effects - This alternative defers opportunities to create openings and viewing opportunities along the roadways. The visual quality would remain subject to the natural influences already in place. Wind damage, fire, or southern pine beetles would create openings. This would provide limited viewing opportunities from the roadways into the Forest. As individual trees die, they would create small openings and stands with a mixture of both live trees and snags.

Alternative 2- Proposed Action

Direct/Indirect effects- The thinning treatments proposed under this alternative would open the forest by removing individual trees throughout many of the stands of timber, allowing better access and scenic views for the public. Regeneration cuts and release treatments would increase foraging for game species and provide better hunting opportunities. The remaining mast-producing hardwoods would be allowed to develop. Midstory removal would clear the underbrush, vines, and small woody vegetation in the midstory, leaving an open stand with well-spaced trees, thus increasing the access for dispersed recreation. Roads that are adversely affected by equipment tread and disruption could limit admittance to newly opened forest.

Immediately after harvesting operations under the all action alternatives, logged-over areas would be visually displeasing due to remaining debris, damage to understory vegetation, and road scars (Forest Plan, pg 4-22). Road reconstruction would result in removing vegetation (Forest Plan, pg. 4-10). Road reconstruction would be visually displeasing while in progress (Forest Plan, pg. 4-23). Vegetation deadened during site

preparation or release activities would be unsightly until it is screened from view by new vegetation (Forest Plan, pg. 4-23). At the same time, timber-harvesting activities can be effectively utilized to achieve visually acceptable variety along travelways. This would create changing and more interesting landscapes along the roads (Forest Plan, pg. 4-22 and 4-23). Thinning would contribute to visual variety and increase visual distances into the Forest (Forest Plan, pg. 4-23). Properly shaped and placed regeneration cuts enhance the visual variety, and thinning increases and enhances the visual absorption (Forest Plan, pg. 4-7). Thinning would have the effect of increasing visual penetration and promoting visual variety (Forest Plan, pg. 4-23). Visual disruption from thinning treatments should be negligible after three to four months (USDA-FS 1989).

Cumulative effects - The proposed management actions in any alternative would not jeopardize the ecosystem service values. Good water quality would be protected by restricting harvesting in streamside protection zones. Recreational opportunities would not be changed because the developed recreation area in project area would not be affected. Dispersed recreation in the form of hunting and motorized bike riding could be temporarily disturbed; but, harvesting and burning would open the woods, which in most cases is viewed as favorable by the hunter and is irrelevant to the OHV rider as long as the trails are not closed. The proposed longleaf pine ecosystem management could be interpreted as aesthetically unpleasing, but the benefits to the endangered RCW in the long-term would exceed the short-term unfavorably-viewed affects.

Alternative 3

Direct/Indirect effects - Effects of this alternative would be similar to the Proposed Action.

Cumulative effects - Effects of this alternative would be similar to the Proposed Action. The proposed amendment to the Forest Plan would have no additional cumulative effects to the recreation resources.

3.3.3 Heritage Resources

Affected Environment

The District Archaeologist and technicians in consultation with the Mississippi State Historic Preservation Office conducted a heritage resource inventory and survey of the Analysis Unit 23 Project Area. This survey was conducted in accordance with the National Historic Preservation Act, associated statutes and regulations, and the signed Memorandum of Understanding among the USDA Forest Service, the Mississippi Department of Archives and History (Mississippi State Historic Preservation Office), and the Advisory Council on Historic Preservation Concerning the Management of Heritage Resources in the National Forest in Mississippi.

These heritage surveys discovered 22 new sites. There were two sites listed as "unknown" which were located and recorded by the District Archaeologist. These sites are to be protected as potentially eligible for listing in the National Register of Historic Places. There were nine sites previously discovered within the survey area. Two of these sites were considered unknown regarding their nomination to the National Register of Historic Places and have been protected in the past and will continue to be protected.

No National Register sites were identified. A survey report and description of all sites will be submitted to the State Historic Preservation Officer with recommendations for protection of appropriate sites. The State Historic Preservation Officer agrees with these findings and proposed protection coordination, and the letter of concurrence is in the project folder of Analysis Unit 23.

Alternative 1 – No Action

Direct/Indirect/Cumulative effects- Under this alternative there would be no effects to heritage resources. No management activities would be implemented.

Alternative 2- Proposed Action

Direct/Indirect effects- The sites considered potentially eligible (need monitoring or status unknown) on the national Register of historic Places would be protected in accordance with the management requirements specified in Section 2.6, Heritage, of this document. A sufficient buffer would be provided around sites to minimize effects form management activities. In the event that any additional heritage resource sites are discovered during forest management activities, all work at the location would be suspended and the District Archaeologist would be notified for consultation.

Cumulative effects - Based on the intensity of the surveys conducted and the management requirements applied, there is no reasonable expectation of cumulative effects on heritage resources considered to eligible or potentially eligible for placement or listing on the National Register of Historic Places. To have a cumulative effect, sufficient information would have to be lost over tome and over the forest, such that understanding of prehistoric and historic settlement activities would be lost. The removal of eligible and potentially eligible sites from the proposed action and its alternatives would prevent any adverse cumulative effect by preventing a substantial loss of information from such areas. The monitoring of known heritage properties would not only protect the resource against land disturbance of the management actions, but it would also allow for the protection of sites against potential looting and natural erosion.

Alternative 3

Direct/Indirect effects - Effects of this alternative would be similar to the Proposed Action.

Cumulative effects - Effects of this alternative would be similar to the Proposed Action. The proposed amendment to the Forest Plan would have no additional cumulative effects to the heritage resources.

4.0 LIST OF PREPARERS AND PERSONS CONSULTED

4.1 Interdisciplinary Team Members

Core team members have responsibility for conducting and overseeing the complete analysis process. Extended team members provide analysis input and reports as requested. All Team members are USDA Forest Service employees.

Table 4.1 List of Id team members

Name	Title	Position
Ken Gordon	Botanist	Core Team Member
Gary Hurst	Forest Engineer	Extended Team Member
Jeff Bein	Fire Management Officer	Extended Team Member
Jay Pittman	Silviculturist	Core Team Member
Francis Gagne	Archaeologist	Extended Team Member
Dave Chabreck	Acting District Ranger/Ops. Team Leader	Core Team Member
Michael Everett	GIS Specialist	Core Team Member
Bill Meriwether	Operations Biologist/Recreation	Core Team Member
Lee Dunham	Forest Service Representative	Extended Team Member

4.2 Individuals and Organizations Consulted

Mayor	William	G	Adams
Mr.	Alton		Applewhite
Mr.	Donald		Applewhite
Mr.	John	M.	Behan
Mr.	Brian		Bird
Ms.	Carla		Boucher
Mr.	Donny		Bracey
Mr.	Bill		Brame
Mr.	Elmer		Buie
Dr.	Wes		Burger
Mr.	Milton		Burris
Mr.	Nelson		Causey
Mr.	Steve		Causey
Mr.	Charles		Chapman
Mr.	Jo Ann		Clark
Mr.	Andy		Cody
Mr. & Mrs.	Marvin		Corban
Mr.	Steve		Corbitt
Mr.	Billy	J.	Davis
Dr.	Neil		Douglas
Mr.	Ella		Dunigan
Mr. & Mrs.	Edward		Flowers
Mr.	Craig		Forman
Mr. & Mrs.	Eddie		Forman

Mr.	Gary		Forman
Mr.	Charles		Freeman
Mr.	Floyd		Freeman
Ms.	Becky		Gellette
Mr.	Cliff		Givens
Ms.	Horace	G.	Godbold
Miss	Linda		Godbold
Ms.	Wilmer		Godbold
Mr.	Horace	G.	Godbold, Jr.
Mr. & Mrs.	Hal		Graves
Mr.	K.	M.	Graves
Ms.	Kathy		Harris
Ms.	Libby		Hartsfield
Ms.	Louise		Hatfield
Mr.	B.	B.	Hemphill
Mr.	Donald		Holland
Mr.	Farrell		Holland
Mr.	Joe		Holland
Mr.	Eldon		Hopf
Mr.	Charlie		Horhn
Dr.	Cathy		Shropshire
Dr.	George		Hurst
Mr.	W	G	Johnson
Mr.	Bart		Jones
Mr.	Gary		Jones
Mr.	Jimmy		Jones
Mr. & Mrs.	John		Kelley
Mr.	Jonathan		Kemp
Mr.	Daniel		Coggins
Mr.	Sam		Laird
			US Fish & Wildlife Service
Mr.	George		Collins
Mr.	Donnie		Lewis
Mr.	Gary		Littleton
Mr.	John		Locke
Mr.	Robert		Lofton
Mr.	Ricky		Long
Mr.	Sam		Mabry
Mr.	Charles	E.	McCall
Mr.	Bobby		McGehee
Ms.	Maxine		McGehee
Mr.	Larry		Mercer
Mr.	Mike		Murphy
Mr.	Wayne		Nations
Sheriff	James		Newman
Mayor	Betty		Norris
Mr.	Rickey	V.	O'Quin
Mr.	Morgan		Palmisano
Mr.	Donny		Parinio
Mayor	Ken		Petty

Mr.	J.	E.	Pickering
Mr.	Chris		Alonzo
Mr.	Robert		Posey
Mr.	Harold		Prather
Mr.	Charles	H.	Prichard
Mr.	J.	Ted	Ratcliff
Mr.	Gordon		Redd
Mr.	Lonnie	P.	Reed
Mr.	Ben		Robbins
Ms.	Lydia		Rogers
Mr.	Felder		Rushing
Mr.	Devin	M.	Ceartas
Mr.	Jimmy		Seale
Mr.	Joe		Seale
Mr.	Gene	A.	Sirmon
Mr.	A.	J.	Smith
Mr.	Clyde		Smith
Mr.	Donald		Smith
Mr.	Kelcy	E	Smith
Ms.	Lillie		Smith
Mr.	Roy		Smith
Mr.	David		Southerland
Ms.	Linday		Stanford
Mr.	Gene		Taylor
Mayor	Greg		Tindle
Mr.	Richard	E.	Smith
Mr.	James	A	Torrey
Mr.	Paul		Tynes
Ms.	Mary	Lou	Webb
Mr.	Elie		Whittiger
Mr.	Jackie		Whittington
Mr.	Bob		Bradford
Mr.	Randy		Woolley
Mayor	Arthur		Littleton
			Adams County Board of Supervisors
Mr.	Eddie		Carter
			Copiah Board of Supervisors
Mr.	Archie		England
			International Paper Timberland
			Jefferson County Board of Supervisors
			Lincoln County Board of Supervisors
			Nature Conservancy
			Southern Lumber Company
			Weyerhauser
			Wilkinson County Board of Supervisors

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Mr. & Mrs.	Alton		Balfontz
Ms.	Mae	Bell	Griffin
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Mr.	Carl	D.	Allred, Sr.
Ms.	Kathrene		Murray
Ms.	Betty	Leake	Forman
Mr.	John	Robert	Spillman
Ms.	Viola		Granger
Mr.	Melvin		Whigham
Mr. & Mrs.	Samuel		Adams
Mr.	James		Triche
Ms.	Betty	Jean	Smith
Ms.	Cindy		Owens
Ms.	Fannie		Davis
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Mr.	Willis	O.	Foreman
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Ms.	Evelyn	F.	Svetich
Mr.	Raymond		Cassels
Mr.	Sidney	C.	Arnold
Ms.	Charlotte		Miller
Mr.	Frank	G.	Barnes
Mr.	Richard		Hopkins
Mr.	David	J.	Cassels
Mr.	Charlie	B.	Murry
Mr.	Robbie		Clark
Mr.	Rainford	G.	Strong
Mr.	Walter	C.	Foreman
Mr.	Milton		Cassels
Mr.	Robert	M.	Bailliet
Ms.	Alice		Baxter
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Mr.	Luther	Williams	Cassels
Mr.	Pole		Wilson, Jr.
Ms.	Dollye	D.	Haynes
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Mr.	Van		Riley
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Mr.	David		White	
Mr.	David		Hastings	
Mr.	Fred	A.	Anderson, III	
Mr.	Jessie		Crum	
Mr.	Robert		Rymer	
Mr.	Davis	N.	McDowell, Jr.	
Ms.	Blanche	B.	Delaughter	
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Ms.	Kathleen		White	
Ms.	Bonnie		Jackson	
Mr.	Marshall		Miller	
Mr.	David		Hastings	
Mr.	Ronnie		Juban	
Mr.	John	C.	McCabe	
Mr.	William		Taylor, Jr.	
Ms.	Jeanette	S.	Hood	
Mr.	Bobby		Duncan	
			Duke Energy Corp.	
Mr.	Kevin		Bonds	
Chief	Beasley		Denton	MS Band of Choctaw Indians
Mr.	Ken		Carleton	MS Band of Choctaw Indians
Chief	Cheryl		Smith	Jena Band of Choctaw Indians
Mr.	Mike		Tarpley	Jena Band of Choctaw Indians
Chief	Gregory	E.	Pyle	Choctaw Nation of Oklahoma
	Terry		Cole	Choctaw Nation of Oklahoma
Chief	Earl		Barbry Sr.	Tunica-Biloxi Tribe of Louisiana
	Earl		Barbry Jr.	Tunica-Biloxi Tribe of Louisiana
Governor	Bill		Anoatubby	Chickasaw Nation
Mr. or Ms.	Gingy		Nail	Chickasaw Nation
Chairman	Buford	C.	Rowland	Poarch Band of Creek Indians
	Robert		Thower	Poarch Band of Creek Indians
Chairman	John		Berrey	Quapaw Tribe of Indians
	Carrie	V.	Wilson	Quapaw Tribe of Indians

4.3 References

In preparation for this analysis, interdisciplinary team members and specialists reviewed the current scientific literature. The following literature has been cited in this analysis. It is considered by the specialists preparing this document to be the best available science.

Brenderman, S., Sternburg, J. 1999. Missouri's Freshwater Mussels. Missouri Conservationist. http:// www.mdc.mo.gov/conmag/1999/08/index.htm

Clingenpeel, Alan. 1999. Cumulative Effects Analysis for Water Quality and Assosciated Beneficial Uses, National Forest in Mississippi. USDA Forest Service.

Conner, Kristina F., ed. 2004. Proceedings of the 12th biennial southern silvicultralist research conference. Gen. Tech. Rep. SRS-71. Ashville, NC: USDA, Forest Service, Southern Research Station.

Croke, J., Hairsine, P., Fogarty, P. 2001. Soil recovery from track construction and harvesting changes in surface infiltration, erosion and delivery rates with time. Elsvier Science.

Croker, T.C., Jr. 1990. Longleaf pine--myths and facts. In Proceedings, Symposium on the Management of Longleaf Pine. Edited by R.M. Farrar, Jr. USDA Forest Service Gen. Tech. Rep. No. So-75. pp. 2-10

Dickson, J.G., K.E. Franzreb, F.R. Thompson, and R.N. Conner. 1992. Effects of silviculture on neotropical migratory birds in central and southeastern oak pine forests. *In* Status and management of neotropical migratory birds: September 21-25, 1992, Estes Park Center, Colorado. Fort Collins, Colorado: Rocky Mountain Forest and Range Experiment Station, U.S. Department of Agriculture, Forest Service, 1993. General technical report RM; 229.

Dissmeyer, George E. and Stump, Richard F. 1978. Predicted Erosion Rates for Forest Management Activities and Conditions Sampled in the Southeast. USDA Forest Service. Atlanta, GA.

Douglass, J.E., Van Lear, D.H. 1983. Prescribed burning and water quality at ephemeral streams in the Piedmont of South Carolina. Forest Science 29:181-189.
EXTOXNET: The Extension Toxicology Network. 1993. Hexazinone. Cornell University. http://pmep.cce.cornell.edu/profiles/extoxnet/haloxyfop-methylparathion/hexazinone-ext.html

Fettig, C. J., Klepzig, K., Billings, R., Munson, A., Nebeker, T., Negron, J., Nowak, J. 2007. The effectiveness of vegetation management practices for prevention and control of bark beetle infestations in coniferous forests of the western and southern United States. Forest Ecology and Management. 238(1-3): 24-53

Foltz, R. B., Rhee, H., Yanosek, K. A. 2007. Transactions of ASABE. 50(6): 1937-1943.

Grace III, J.M., Rummer, B., Stokes, B.J., Wilhoit, J. 1998. Evaluation of Erosion Control Techniques on Forest Roads. American Society of Agricultural Engineers.

Grace III, J.M. 2005. Transactions of the ASAE, Vol. 48(2): 871-880

Landres, P.B., J. Verner, and J.W. Thomas. 1988. Ecological Uses of Vertebrate Indicator Species: A Critique. Conservation Biology, Vol 2(4):316-328.

Larson, D. R. 2002. Field Planting Containerized Longleaf Pine Seedlings. Gen. Tech. Rep. SRS-56. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. p. 62-63

La Sorte, Frank A.; Thompson, Frank R., III; Trani, Margaret K.; Mersmann, Timothy J. 2007. Population trends and habitat occurrence of forest birds on southern national forests, 1992-2004. Gen. Tech. Rep. NRS-9. Newton Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 260

Lucas, K.E. 1993. Modeling avian response to red-cockaded woodpecker habitat management in loblolly pine forests of east-central Mississippi. M.S. Thesis. Mississippi State University. Mississippi State, Mississippi. 165p.

Lewis, Jack. 1998. Evaluating the Impacts of Logging Activities on Erosion and Suspended Transport in the Casper Creek Watersheds. USDA Forest Service Gen. Tech. Rep. PSW-GTR-168-Web.

Marshall, Douglas J., Wimberly, M., Bettinger, P., Stanturf, J. 2008. Gen. Tech. Rep. SRS-110. Asheville, NC: U.S. Department of Agriculture Forest Service, Southern Research Station. 43 p.

Miller, James. 2003. Nonnative Invasive Plants of Southern Forests. USDA Forest Service, Southern Research Station. Asheville, NC.

Mississippi Department of Environmental Quality. 2008. Air Quality Data Summary.

Mississippi Department of Wildlife, Fisheries and Parks. 1995. Endangered Species of Mississippi.

Nature Conservancy. 1982. Natural Heritage Program Operations Manual. Arlington, VA: The Nature Conservancy

Noss, R.S. 1987. From plant communities to landscapes in conservation inventories: a look at the Nature Conservancy (USA). Biological Conservation 41:11-37.

Schmidtling, R.C., Hipkins, V. 1998. Genetic diversity in longleaf pine (*Pinus palustris*): influence of historical and prehistorical events. NRC Canada.

Shultz, Robert L. 1997. Loblolly Pine- the Ecology and Culture of Loblolly Pine (*Pinus taeda* L.). Agricultural Handbook 713.

Smith, J.A. 1995. Survey of the Southern Wood Fern (*Dryopteris x australis*) in Southwest Mississippi. Final Technical Report.

SERA: Syracuse Environmental Research Associates, Inc. 2003. Triclopyr - Revised Human Health and Ecological Risk Assessments. Final Report. SERA TR 02-43-13-03b.

SERA: Syracuse Environmental Research Associates, Inc. 2004. Imazapyr - Human Health and Ecological Risk Assessments - Final Report. SERA TR 04-43-17-05b.

SERA: Syracuse Environmental Research Associates, Inc. 2004. Sulfomenturon Methtl - Human Health and Ecological Risk Assessments - Final Report. SERA TR 03-43-17-02c.

SERA: Syracuse Environmental Research Associates, Inc. 2005. Hexazinone - Human Health and Ecological Risk Assessments - Final Report. SERA TR 05-43-20-03d.

Summer, W.B., Jackson, Rhett, C., Jones, D., Miwa, M. 2006. Gen. Tech. Rep. SRS-92. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. pp. 387-391

USDA Forest Service. 1984. Soil Resource Inventory Report. Homochitto National Forest, USDA Forest Service, National Forests in Mississippi. Jackson, MS.

USDA Forest Service. 1985(a). Final Environmental Impact Statement for the National Forest in Mississippi, Land and Resource Management Plan. Southern Region, USDA Forest Service

USDA Forest Service. 1987. Final Environmental Impact Statement for the Suppression of the Southern Pine Beetle, Southern Region. Management Bulletin R8-Mb 2. Southern Region, USDA Forest Service

USDA Forest Service. 1989. A Guide for Prescribed Fire in Southern Forests. USDA Forest Service Southern Region, Technical Publication R8-TP 11.

USDA Forest Service. 1989. Final Environmental Impact Statement for the Vegetation Management in the Coastal Plain/Piedmont. (Vol. I and II) Management Bulletin R8-Mb 23. Southern Region, USDA Forest Service

USDA Forest Service. 1995. Final Environmental Impact Statement for the Management of the Red-cockaded Woodpecker and its Habitat on National Forests in the Southern Region. Management Bulletin R8-Mb 73. Southern Region, USDA Forest Service

USDA Forest Service. 2000. FY00 Soil Resource Monitoring Homochitto National Forest, National Forest in Mississippi.

USDA Forest Service. 2002. National Forest in Mississippi Management Indicator Species Population and Habitat Trends.

USDA Forest Service. 2005. National Forest in Mississippi Management Indicator Species Population and Habitat Trends.

USDA Forest Service. 2008. Environmental Assessment – Southern Pine Beetle Project. Homochitto National Forest, National Forest in Mississippi.

USDA Natural Resource Conservation Service. 2005. Major Land Resource Areas in Mississippi. http:// www.mo15.nrcs.usda.gov/technical/mla_image_ms.jtml

U.S. Fish and Wildlife Service/Southeast Region. 2003. Red-cockaded woodpecker recovery plan. 2nd revision, p. 222
http://ecos.fws.gov/docs/recovery_plans/2003/030320.pdf

Wilson, C.W., R.E. Masters, and G.A. Bukenhofer. 1995. Breeding bird response to pine-grassland community restoration for red-cockaded woodpeckers. J. Wildl. Manage. 59(1):56-6

5.0 APPENDICES

APPENDIX A

Biological Evaluation

(Filed Separate)

APPENDIX B

Forest Plan Amendment

Forest Plan Amendment

National Forests in Mississippi

Land and Resource Management Plan

Amendment # 19
July 2011

This amendment conforms the National Forests in Mississippi Land and Resource Management Plan (Forest Plan) direction regarding the Homochitto National Forest to incorporate the U.S. Fish and Wildlife Service Red-cockaded Woodpecker (*Picoides borealis*) Recovery Plan. [U.S. Fish and Wildlife Service. 2003. Recovery plan for the red-cockaded woodpecker (*Picoides borealis*): second revision. U.S. Fish and Wildlife Service, Atlanta, GA. 296pp.] This amendment will replace current guidance in the Forest Plan including The Interim Standards and Guidelines for the Protection and Management of Red-cockaded Woodpecker Habitat within ¾ mile of Colony Sites with updated conservation and recovery strategies adopted by the USFWS in their 2003 Recovery Plan. The following changes will be made to the National Forests in Mississippi Land and Resource Management Plan:

#	Existing Forest Plan Direction	Description	Amended Forest Plan Direction
1	1985 Forest Plan, Interim Standards and Guides by Amendment #8 and #14	General reference for source of RCW recovery guidance and silvicultural guidelines within the HMA	Reference most current RCW Recovery Plan. Use even-aged, two-aged, and/or uneven-aged management systems to restore off-site pine to native species in habitat managed for RCW. Limit regeneration (for restoration) size to 40 acres or less. Regeneration up to 80 acres for restoration when at least 1 mile from active or recruitment clusters.
2	1985 Forest Plan, pages 4-7, 4-8	Manage to attain a goal of four RCW colonies per 1,000 acres of suitable habitat.	Population size at delisting – 250 (PBG).
4	1985 Forest Plan, #1, page 4-7	Manage longleaf pine working group on an 80-year rotation in each compartment.	Manage longleaf using rotation intervals not less than 120 years.

#	Existing Forest Plan Direction	Description	Amended Forest Plan Direction
5	1985 Forest Plan, #1, page 4-7	Manage other pine working groups or their equivalent on a 70-year rotation.	Manage loblolly using rotation interval not less than 100 years. An exception to this for stands under high risk of mortality due to insects, disease, or other site related problems may be given on a case by case basis through consultation with USFWS.
6	1985 Forest Plan #2, Page 4-7 and Interim Standards and Guides	Provide at least 125 acres of foraging habitat 30 years old or older connected to and within ½-mile of all active colonies and replacement/recruitment stands. 40% of the acreage in each foraging area should be 60 years plus if available. Provide at least 6,350 pine stems ≥ 10" DBH and 8,490 ft² of pine BA within ½ mi. and contiguous with the colony site.	For site index ≥ 60, provide 120 acres of quality foraging habitat
			For site index < 60, provide 200 to 300 acres of foraging habitat – with some exceptions
			18 or more stems/acre ≥ 60 years old and ≥ 14 DBH, min. BA 20ft²
			Not separated by > 200 feet of non-foraging area (hardwood stand, water, regen. area)
			Must be within ½ mile of the center of the cluster
			Min. BA is 40ft½. For trees < 10" DBH, BA is < 10 ft². For trees 10-14" DBH, BA is between 0 and 40 ft²
			Hardwood midstory is sparse and < 7 ft. tall
			Ground vegetation of bunch grass or herbs > 40%
7	1985 Forest Plan, #3, page 4-7	Establish 10-acre replacement/recruitment stand for each existing colony and for each additional colony required to meet	Provide a constant supply of unoccupied recruitment clusters equal to 10 percent of total active clusters in the population.

#	Existing Forest Plan Direction	Description	Amended Forest Plan Direction
		population objective. These stands should be at least 60 years old.	
8	1985 Forest Plan, #4, page 4-7	The colony site and replacement/recruitment stand can be part of the foraging habitat if it meets the qualifications.	If recovery standard is not met, then assign each recruitment cluster at least 120 acres of foraging habitat that meets elements (b,c,d,f,g,h, and i), and additionally, stands should contain no more than 70ft²/ac basal area in total.
9	1985 Forest Plan, #5, page 4-7	Since the replacement stand is located within the foraging habitat of an existing colony, no additional foraging habitat needs to be provided.	NA

NFMA Significance:

This amendment is not a significant change in the National Forests in Mississippi Forest Plan. The determination that this is a non-significant amendment is made in accordance with the regulations in 16 USC 1604(f)(4), 36 CFR 219.10(f) of the planning regulations in effect before November 9, 2000 (as authorized by 36 CFR 219.14(b)(2) of the current planning regulations, dated April 21, 2008), and Forest Service Manual 1926.5, Land Management Planning, Amendments. This plan amendment meets the criteria for a non-significant amendment because these changes will not "significantly alter the long-term relationship between levels of multiple-use goals and objectives originally projected . . . [or] have an important effect on the entire forest plan or affect resources throughout a large portion of the planning area during the planning period" (FSM 1926.52). The NEPA analysis for this change is documented in a Decision Notice and Environmental Assessment.

APPENDIX C

Response to Comments

Chapman Comments Tracking Worksheet **Project:** AU-23

Table 1 Comments Received

Comment Letter Name	**Tracking Description**
Charles Chapman	Chapman

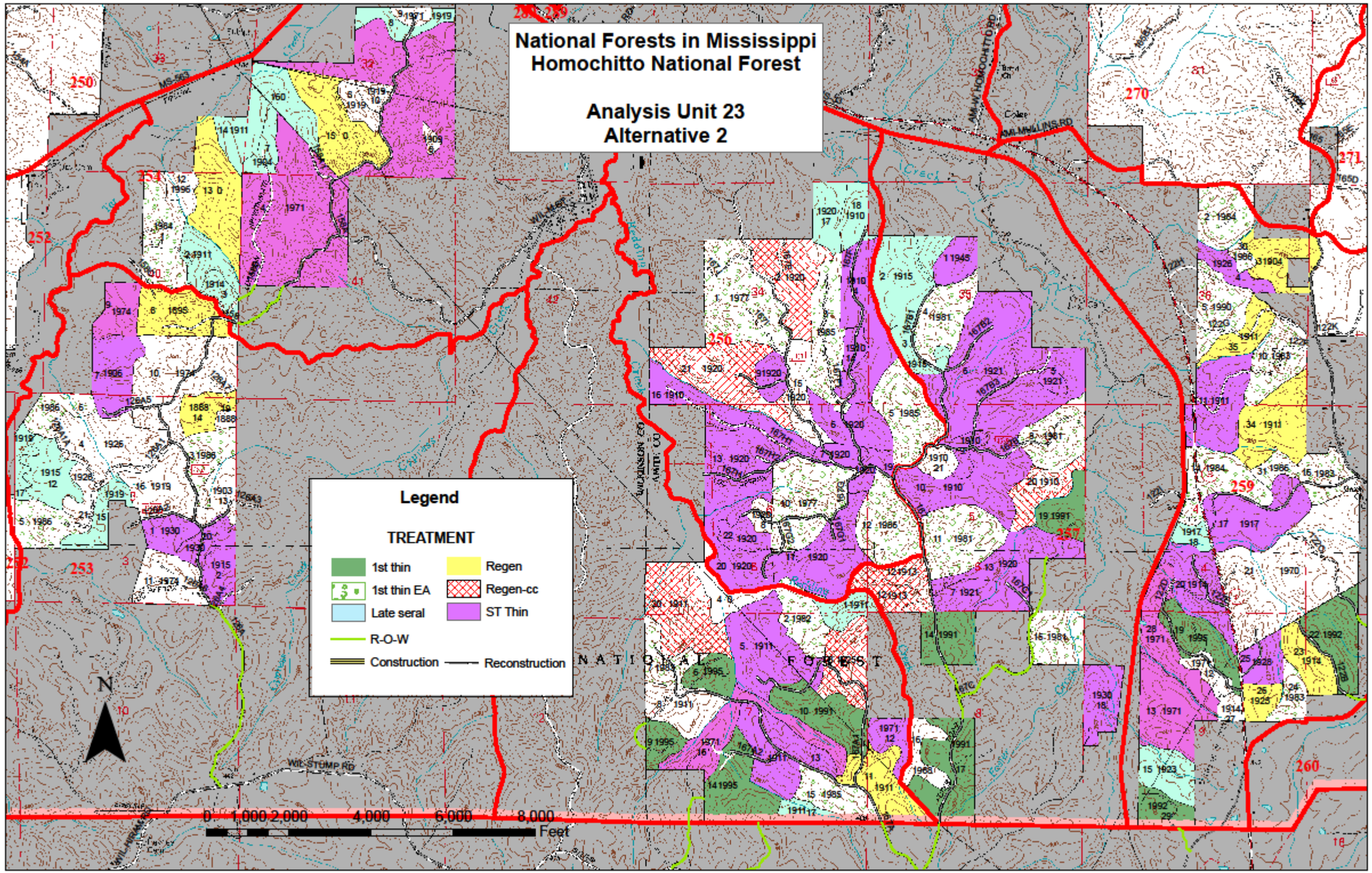
Table 2 Summary or Comments

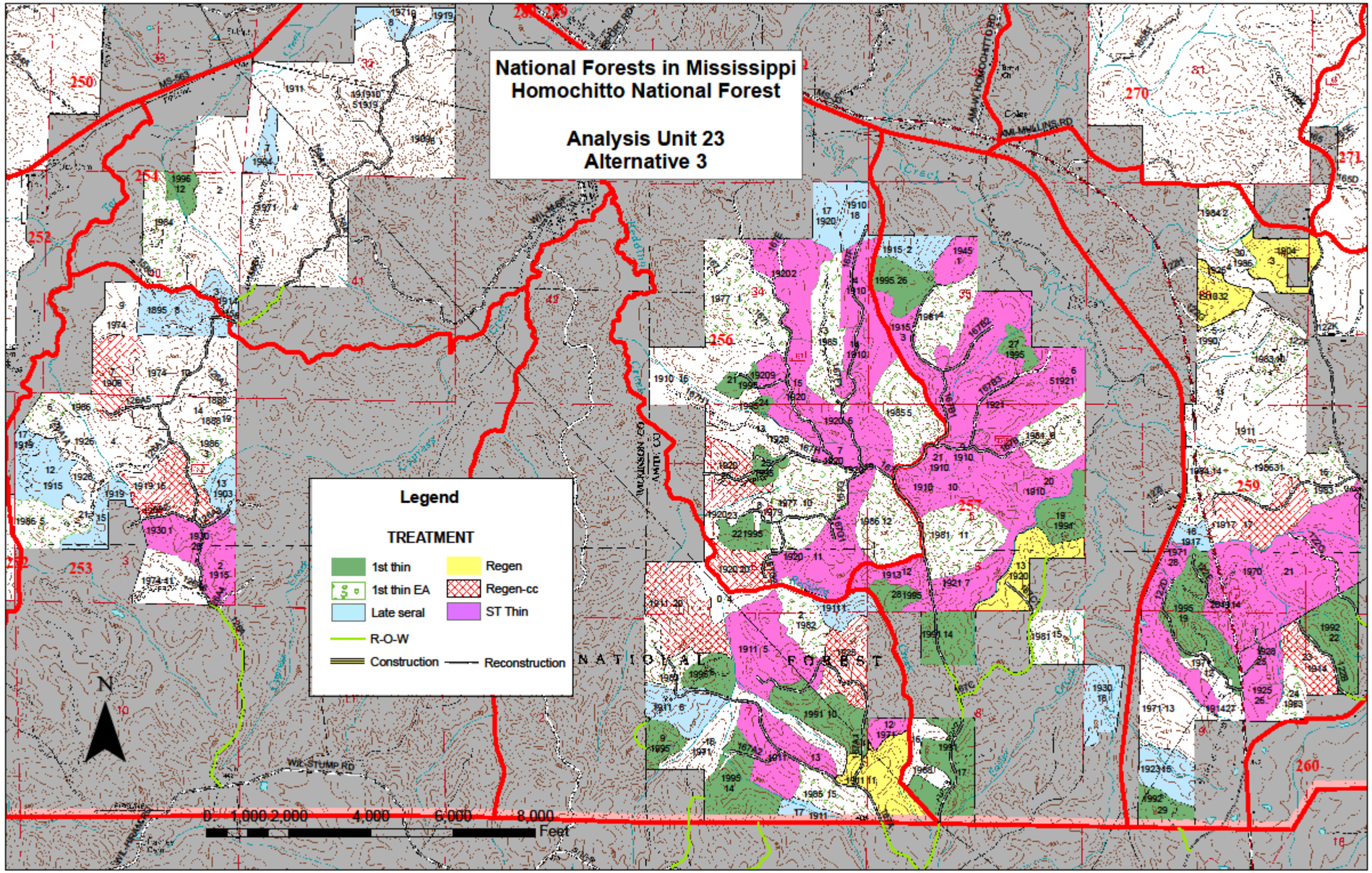
Comment	**Resource Area**	**Source**	**Response**
More regeneration needs to be scheduled for AU 23	Vegetation	Chapman	Conjectural. Regeneration determination was based on the maximum allowable under Forest Plan and RCW Recovery Plan standards and guidelines.
Forest is planting longleaf pine offsite.	Vegetation	Chapman	Planting of longleaf pine is proposed in areas where the soils are capable of growing longleaf pine and the area is capable of being prescribed burned
Make another alternative to include management activities in Compartment 253 and 254 to that favor RCW habitat improvement.	Vegetation	Chapman	Comment noted. Compartments 253 and 254 currently do not provide adequate RCW habitat. Also the ID Team identified concerns of access to the areas and terrain within the areas. As a result of the above mentioned concerns, management activities were focused in areas more suitable for RCW habitat improvement. The incorporation of the forest plan amendment will allow the use of the best available science (the recovery plan) into future analyses and decisions to help work toward RCW recovery objectives across the Homochitto NF.
Road reconstruction will produce ad deficit sale	Economics	Chapman	Projected road costs are considered along with estimated timber values

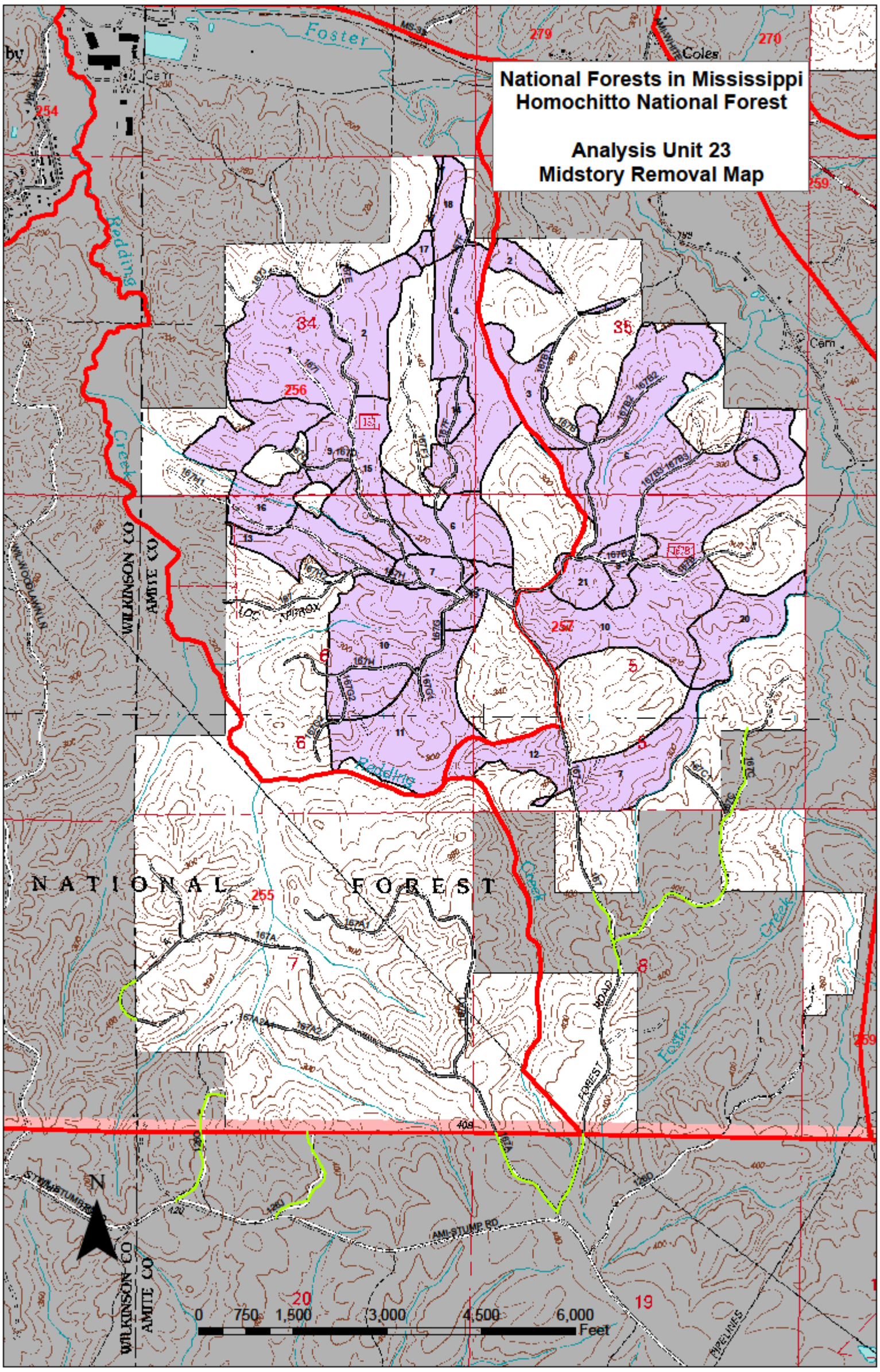
Comment	Resource Area	Source	Response
			during the sale planning process. Efforts taken during this process minimize the potential for deficit timber sales. A deficit sale is not anticipated for any sale resulting from the AU 23 proposal.
Last known water quality monitoring within harvested areas was done in 2000. Has there been any monitoring since? How can we use a baseline of from 2000 study?	Soils	Chapman	Timber sale administration provides for continuous monitoring of Forest Plan Standards and Guides (S&Gs) in active open treatment areas. These S&Gs are designed and prescribed to protect water resources, and they have been demonstrated to be effective when used. Since neither the land nor the methods/equipment used during a timber sale have changed since the 2000 study, there is no expectation that effects would be any different.
Prescribed burning should be done on entire Analysis Unit since it is within the RCW HMA	Fire	Chapman	Conjectural. All areas (such as drains) were not historically subject to the frequent fires common on the uplands. Other areas may be excluded from the prescribed burning program due to other resource conflicts

APPENDIX D

Maps


National Forests in Mississippi
Homochitto National Forest
Analysis Unit 23
Alternative 2
Legend
TREATMENT
1st thin
1st thin EA
Late seral
R-O-W
Construction
Regen
Regen-cc
ST Thin
Reconstruction
N
0 1,000 2,000 4,000 6,000 8,000
Feet


National Forests in Mississippi
Homochitto National Forest
Analysis Unit 23
Alternative 3
Legend
TREATMENT
1st thin
1st thin EA
Late seral
R-O-W
Construction
Regen
Regen-cc
ST Thin
Reconstruction
N
0 1,000 2,000 4,000 6,000 8,000
Feet


National Forests in Mississippi
Homochitto National Forest
Analysis Unit 23
Midstory Removal Map
Foster
Redding
Creek
Coles
Cem
WILKINSON CO
AMITE CO
NATIONAL FOREST
AMI-STUMP RD
FOREST ROAD
PIPELINES
N
0 750 1,500 3,000 4,500 6,000
Feet