

Environmental Assessment

Forest Health and Longleaf Restoration

Tuskegee Ranger District, Tuskegee National Forest

Macon County, Alabama



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Figure i: Loblolly pine showing evidence of decline.



Figure ii: Young longleaf stand needing precommercial thinning.



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Summary

The Tuskegee National Forest proposes to restore approximately 796 acres to longleaf pine by clearcutting with reserves, commercially thin approximately 337 acres of upland pines and precommercially thin approximately 40 acres of upland sites for an approximate total of 1,173 acres of treatment over the next 5 years. Site preparation may consist of a combination of herbicides; prescribed fire and /or mechanical means such as roller drum chopping, chainsaws or brush-cutters. The project areas are located in compartments 4, 5, 8, 10, 11, 13, 14, 15, and 18 within the Tuskegee Ranger District, National Forests in Alabama, in Macon County Alabama. This action is needed, because it will improve the long-term health of the Tuskegee National Forest and will implement the National Forests in Alabama Land and Revised Resource Management Plan (RLRMP) forest-wide goals, objectives and standards.

The effects of the proposed action will improve the overall health of the forest, begin the long-term process of restoring the longleaf ecosystem, reduce the wildfire potential, provide additional funding in lieu of taxes to Macon County, improve wildlife habitat and meet the goals and standards of the RLRMP, reduce the threat for insects and disease, produce revenue for local businesses and residents employed by the logger or local businesses.

In addition to the proposed action, the Forest Service also evaluated the following alternatives:

- **No action** – *This alternative provides for custodial-type management of the forest. Little to no harvesting takes place. Species that are off-site and outside their natural range, remain in place. Insect outbreaks are usually monitored. Longleaf restoration would probably not occur.*
- **No herbicide use for site preparation or control/eradication of nonnative species** – *Restores approximately 796 acres to longleaf pine and thins approximately 337 acres of upland pine sites. Prescribed fire would be used for site prep. Additional site prep would be mechanical, such as roller drum chopping.*
- **Thinning Only**- *Selected loblolly and slash stands, totaling approximately 450 acres, would be thinned to a residual basal area of 40 to 60 square feet per acre. Any longleaf and shortleaf pines would be left in the selected stands. No herbicide treatments to control nonnative invasive species would occur. Regeneration of longleaf or shortleaf pine would occur from within the thinned areas or adjacent stands. Prescribed burning would continue.*
- **Noncommercial Harvesting** – *Under this alternative, trees would not be sold. Trees would remain on site, piled and burned, or chipped. Herbicides would be used for site prep and control of nonnative invasive species. Prescribed fire will still be used. Treated stands would then be planted with longleaf seedlings.*
- **Specialized Equipment** – *Use equipment such as forwarders that can cut and delimb trees at the stump. Limbs and tops (depending on product) would be used as a mat for the equipment to drive on reducing the possibility of soil erosion. In stands designated for restoration, longleaf pine would be planted. Herbicides would be used to control nonnative invasive species, site prep.*

Additional site prep would be by mechanical means such as drum chopping or hand tools. Prescribed fire will continue to be used.

- **Restore More Acres** – *This alternative proposes approximately; 1062 acres of longleaf pine restoration, 543 acres of thinning of loblolly/slash stands and thinning of 94 acres of longleaf pine stands. Herbicides will be used to control nonnative invasive species and site prep. Additional site prep will be by mechanical means such as roller drum chopping or hand tools. Prescribed fire would be used.*
- **Stewardship Contracting** – *This alternative proposes to use a type of instrument known as Stewardship Contract, rather than the standard Forest Service Timber Sale Contract, to implement any restoration projects on the Tuskegee National Forest. Stewardship Contracts provide goods for services performed.*
- **Road closure and obliteration** – *Should any roads be closed and obliterated? If so which ones?*
- **Restore fewer Acres** - *Under this alternative, only 319 acres would be restored in this 5 year period. Herbicides would be used to control/eradicate nonnative invasive species and site prep in conjunction with mechanical treatments. Roller drum chopping and prescribed burning are also used for site prep and for fuel reduction.*



Figure iii: Prescribed fire in the Tuskegee National Forest

Chapter 1

1.0 Introduction

1.1 Document Structure

The Forest Service has prepared this Environmental Assessment in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. The document is organized into four parts plus appendices:

- (1) *Introduction*: This section includes information on the history of the project proposal, the purpose of and need for the project, and the agency's proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.
- (2) *Comparison of Alternatives, including the Proposed Action*: This section provides a more detailed description of the agency's proposed action as well as alternative methods for achieving the stated purpose. These alternatives were developed based on significant issues raised by the public and other agencies. This discussion also includes possible mitigation measures. Finally, this section provides a summary table of the environmental consequences associated with each alternative.
- (3) *Environmental Consequences*: This section describes the environmental effects of implementing the proposed action and other alternatives. This analysis is organized by Alternative. Within each section, the affected environment is described first, followed by the effects of the No Action Alternative that provides a baseline for evaluation and comparison of the other alternatives that follow.
- (4) *Agencies and Persons Consulted*: This section provides a list of preparers and agencies consulted during the development of the environmental assessment.
- (5) *Appendices*: The appendices provide more detailed information to support the analyses presented in the environmental assessment.

Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at the Tuskegee Ranger District Office on Alabama highway 186; 2 miles east of exit 42 on Interstate 85, or 2 miles west of the intersection of US highways 29 and 80, Tuskegee Alabama.

1.2 Background

The Tuskegee National Forest had its beginning as the Tuskegee Land Utilization Project, which was also known as the Tuskegee Planned Land Use Demonstration. The original project was 10,358 acres of land northeast of Tuskegee Alabama. Much of what is now the Tuskegee National forest was purchased between the years of 1935 to 1938.

Prior to becoming the Tuskegee National Forest the area was highly eroded (photo 1.2-1), cutover, worn-out farmland. In order to accommodate row crops and other types of agriculture, 80% of the trees had been cut. Many of the farming practices that are taken for granted today,

such as contour plowing, terracing and no till planting, were rarely, if ever used in this area.

Figure 1.2-1: Erosion in Macon County. (ca. 1937)



Photograph courtesy of the Library of Congress.

The U.S. Government utilizing the Bankhead-Jones Farm Tenant Act of 1935 purchased the land. On April 30, 1935, President Franklin D. Roosevelt signed Executive Order 7027, creating the Resettlement Administration (RA). Rex Tugwell, the Under Secretary of Agriculture was the director. The RA was divided into four programs: the Land Use Program, the Resettlement Program, the Rehabilitation Program, and the Suburban Program. A poster from the Resettlement Program is shown in Figure 1.2-2.

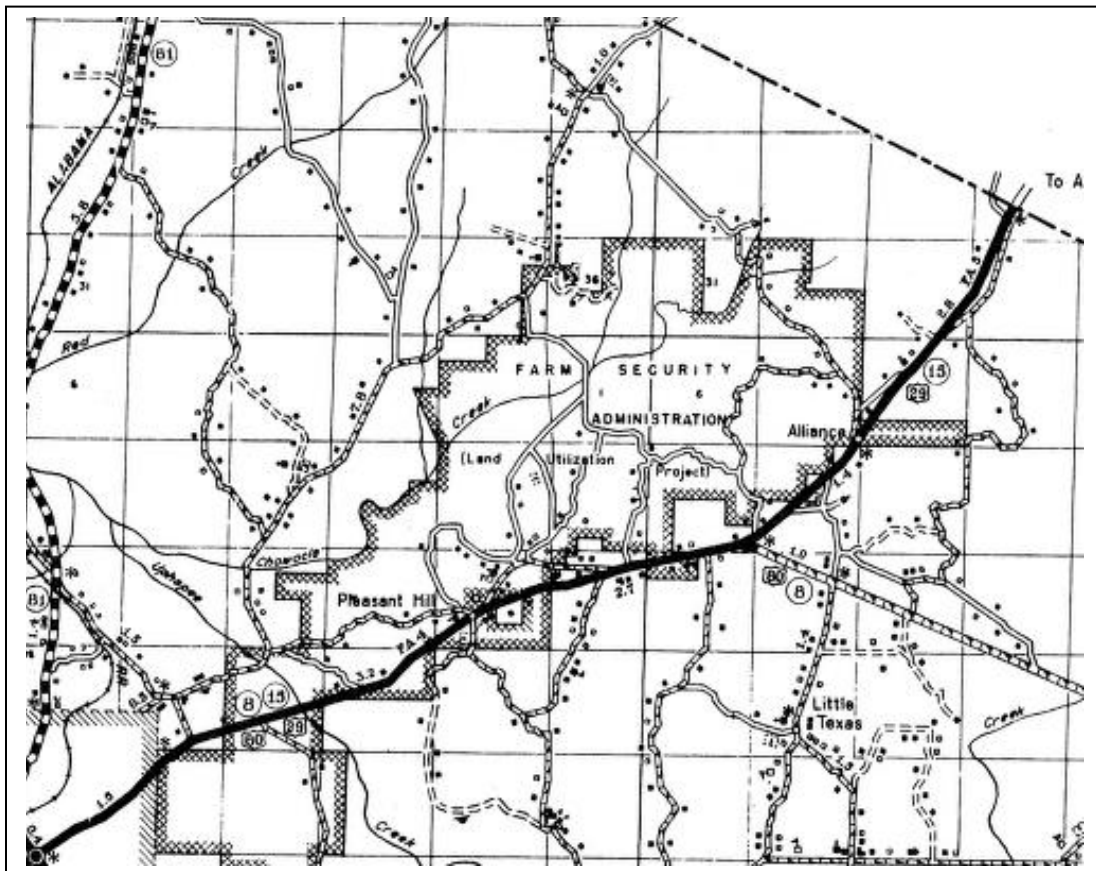
Figure 1.2-2: Resettlement Poster from 1935.



There were four Land Use Programs in Alabama: the Tuskegee Planned Land Development

Project; the West Alabama Planned Development in Bibb, Hale, Perry and Tuscaloosa Counties (now the western half of the Oakmulgee Division of the Talladega National Forest); the Pea River Planned Development Project in Dale and Coffee Counties; and the Oak Mountain Planned Development Project. The government purchased sub-marginal farmland and the occupants were resettled on better farmland (Resettlement Administration 1936). The government then developed it for other uses such as wildlife, forestry, recreation, and erosion control. In 1937, the Farm Security Administration was created, replacing the Resettlement Administration. FSA Land holdings are shown in Figure 1.2-3.

Figure 1.2-3: The 1937 Macon County Highway Map shows the FSA having taken over the Land Utilization Project and reflects the removal of many of the structures in the Tuskegee Land Utilization Project between 1935 and 1937.



The successive federal agencies that had responsibility for what was to become the Tuskegee National Forest in 1959, worked to stabilize the soil by controlling erosion and planting trees. On the Tuskegee National Forest, beginning during the 1930s, most plantings were of loblolly, slash pines and some hardwoods. Figures 1.2-1 and 1.2-4 depicts serious erosion while Figure 1.2-5 shows the planting of trees.

Figure 1.2-4: A typical gully on the Tuskegee Planned Land Development Project, Macon County, Alabama.



Photo 1.2-5: Planting Slash Pine on the Tuskegee Land Utilization Project (ca. 1937).



Photograph courtesy of the Library of Congress.

The Tuskegee National Forest is located in the upper reaches of the East Gulf Coastal Plain Physiographic Region. This region was historically part of the 60-90 million acres of longleaf pine forestland that once covered the Southeastern United States. Currently, 2-3 million acres of longleaf remain across its historical range, much of which is located on public land. The longleaf community has been recognized nationally and by the Southern Appalachian

Assessment as critically imperiled habitat. There is a critical need to manage, restore and maintain any remaining occurrences of the longleaf pine community, especially in restoring the potential habitat for the endangered or imperiled species which depend upon this ecosystem.

The decline of the longleaf ecosystem has been caused by many factors such as land clearing for communities, agriculture, fire suppression, and in the early part of the 20th century, timber harvesting. In places where longleaf pine was harvested, faster growing loblolly and slash pines invaded or were planted.

The accelerated spread of terrestrial and aquatic invasive species is one of the greatest natural resources concerns in the United States and their prevention and control is critical to the stewardship responsibility of the Forest Service. Invasive species know no boundaries – they span landscapes, ownerships and jurisdictions and are spreading at an estimated rate of 1.7 million acres per year across forests and grasslands. The cost to the United States is over \$137 billion each year. Invasive plants threaten ecosystem function, water availability, economic stability, forest production and human health. Second only to direct habitat destruction, invasive species are the greatest threat to native biodiversity and alter native communities, nutrient cycling, hydrology and natural fire. In 2001, \$18 million was spent nationally to treat 130,000 acres.

Invasions of nonnative plants into southern forests, including the Tuskegee National Forest, continue to go uncontrolled. Invasive, nonnative plants have been characterized as “fire in slow motion” and 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. Some have been introduced into this country accidentally, but most were brought here as ornamentals or for livestock forage. These hardy plants arrived without their natural predators of insects and diseases that tend to keep native plants in natural balance. Now these nonnative plants increase across the landscape with little opposition and are often spreading out of control.

On February 3, 1999, Executive Order #13112 was issued establishing the National Invasive Species Council, and directed Federal Agencies, using existing laws and other pertinent statutes, to prevent the introduction of invasive species, to provide for their control and to minimize the economic, ecological and human health impacts that invasive species cause. The invasive species threat has been identified by the Chief of the Forest Service as one of the four significant issues affecting National Forest System lands.

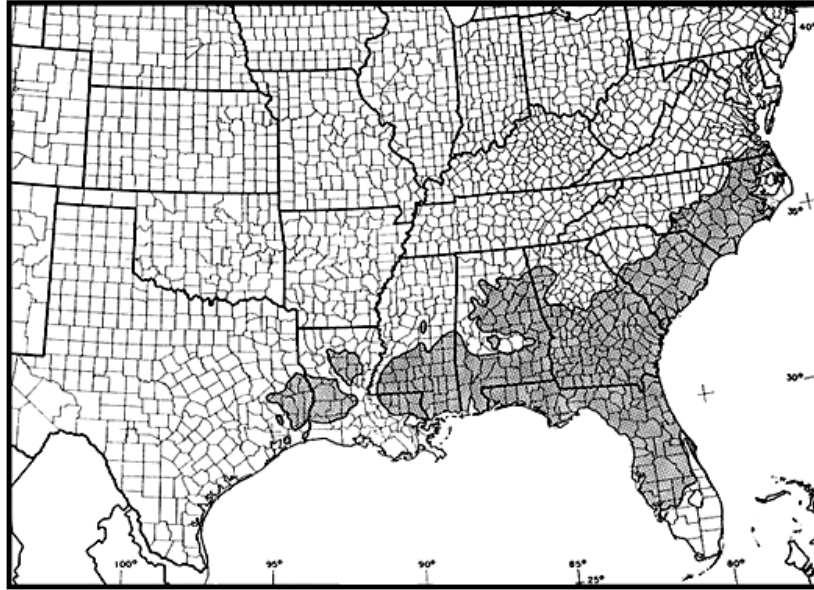
1.3 Purpose and Need for Action

The purpose of this project is to improve the health of the Tuskegee National Forest and improve wildlife habitat by restoring the longleaf pine community and controlling non-native invasive plants.

Historic accounts of pre-settlement forests in the southeastern United States describe an open, park-like, fire-maintained ecosystem dominated by longleaf pines with an understory of fine grasses. As depicted by Figure 1.3-1, the original range of this ecosystem once spanned about 90

million acres, however only about 3 million acres currently remain (Landers, et al; Outcalt and Sheffield). This decline has contributed to over 30 plant and animal species (within the entire ecosystem) currently listed as threatened or endangered under the Endangered Species Act.

Figure 1.3: The Historic Range of Longleaf Pine.



(Little, 1971)

More than 3000 acres of loblolly and slash pine stands, as identified by CISC (Continuous Inventory of Stand Conditions), are found on the Tuskegee National Forest, predominately on upland sites. Many stands are young and overstocked. Some stands are diseased. Some are suffering from decline. Other stands are mature and overstocked and some are old and decadent (falling apart).

The priorities for treatment of off-site stands are any one or combination of the following: older than 10 years of age, contains past evidence of SPB activity, stands with evidence of disease or damage, evidence of poor growth or high levels of mortality. Off-site stands adjacent to the affected stands will be harvested if the opening size does not exceed 80 acres.

The age class distribution of communities on the Tuskegee National Forest shows a distinct lack of early successional habitat (shown in Table 1.3-2, *italics*) across all major habitat groups. The Proposed Action will increase the amount of early successional habitat to approximately 7 percent of total forest acres.

Table 1.3-2: Age class distribution by community type and acres (From CISC 2001 data).

Community Type	Acres
Dry & Dry-Mesic Oak-Pine	3,729
<i>Early (0-10 years)</i>	0
Sapling/Pole (11-30 years)	638
Mid (31-60 years)	1,517
Late (61+ years)	1,574
Wet Pine	946
<i>Early (0-10 years)</i>	0
Sapling/Pole (11-30 years)	251
Mid (31-60 years)	386
Late (61+ years)	309
Upland Longleaf Pine	2,129
<i>Early (0-10 years)</i>	708
Sapling/Pole (11-30 years)	602
Mid (31-60 years)	278
Late (61+ years)	541
River Floodplain	3,539
<i>Early (0-10 years)</i>	148
Sapling/Pole (11-30 years)	492
Mid (31-60 years)	721
Late (61+ years)	2,178
Coastal Plain Upland Hardwood	106
<i>Early (0-10 years)</i>	0
Sapling/Pole (11-30 years)	0
Mid (31-80 years)	106
Late (81+ years)	0

There are a number of invasive plant species within the forest, including, but not limited to, Kudzu (*Pueraria lobata*), mimosa (*Albizia julibrissin*), Shrubby lespedeza (*Lespedeza bicolor*), cogon grass (*Imperata cylindrica*), princess- tree (*Paulownia tomentosa*), Chinese privet (*Ligustrum sinense*), sericea lespedeza (*Lespedeza cuneata*), Japanese privet (*Ligustrum japonicum*), Chinese wisteria (*Wisteria sinensis*), Multiflora rose (*Rosa multiflora*), and Japanese climbing fern (*Lygodium japonicum*) . These species are found primarily along the roadsides, in recreation areas, along trails, at trailheads, along stream banks and in wildlife openings, but are continuing to spread throughout the forest, posing a threat to native ecosystems.

Treatment of non-native invasive plants is proposed to:

- Improve and maintain overall forest health.
- Control invasive nonnative plant species.
- Protect existing native plant species, thereby maintaining viable populations of these native species.

This action is needed because the spread of these species is unchecked and these non-native invasive plants are occupying the habitat of native species.

The proposed action responds to the goals and objectives outlined in the Revised National Forests in Alabama Land and Resource Management Plan (RLRMP), and helps move the project area towards desired conditions (pgs 4-24 through 4-25) as described in the plan. Specific goals and objectives (as found on pages 2-9 through 2-72 of the RLRMP) are listed in Table 1.3-3 below. Forest wide standards are located in the RLRMP. Section 1.4 of this EA provides additional details on the Desired Condition produced by Alternative 2 (Proposed Action).

Table 1.3-3: Project actions and supporting goals and objectives.

Action	Goal(s)	Objective(s)	Pages
<p>Longleaf pine Restoration</p>	<p>Manage forest and woodland ecosystems in order to restore and/or maintain native communities.</p> <p>Provide habitats to support desirable levels of selected species.</p> <p>Achieve a balance between suppression, to protect life, property, and resources, and fire use, to regulate fuels and maintain healthy ecosystems. Use wildland fire to protect, maintain, and enhance resources, and, as nearly as possible, allow fire to function in its natural ecological role.</p> <p>Use fire to restore and maintain fire dependant and associated communities.</p> <p>The National Forests will manage areas to provide for "backcountry" (semi-primitive/remote) recreation experiences.</p> <p>Engage the public and other agencies in cooperative, collaborative efforts that win their trust and support while helping to meet desired future conditions.</p> <p>Encourage cooperation and partnerships with individuals, non-profit organizations, other agencies, special interest groups, clubs and others to achieve the Forest's interpretive activities.</p>	<p>1.2, 1.5, 16.1 - 16.6</p>	<p>2-9, 2-49, 2-53, 2-56, 2-72</p>
<p>Thinning Pine Stands</p>	<p>Manage forest and woodland ecosystems in order to restore and/or maintain native communities.</p> <p>Provide habitats to support desirable levels of selected species.</p> <p>Achieve a balance between suppression, to protect life, property, and resources, and fire use, to regulate fuels and maintain healthy ecosystems. Use wildland fire to protect, maintain, and enhance resources, and, as nearly as possible, allow fire to function in its natural ecological role.</p> <p>Use fire to restore and maintain fire dependant and associated communities.</p> <p>The National Forests will manage areas to provide for "backcountry" (semi-primitive/remote) recreation experiences.</p> <p>Engage the public and other agencies in cooperative, collaborative efforts that win their trust and support while helping to meet desired future conditions.</p> <p>Encourage cooperation and partnerships with individuals, non-profit organizations, other agencies, special interest groups, clubs and others to achieve the</p>	<p>1.4, 1.5, 16.1 - 16.6</p>	<p>2-9, 2-49, 2-53, 2-56, 2-72</p>

Action	Goal(s)	Objective(s)	Pages
Control of non-native invasive species	<p>Forest's interpretive activities.</p> <p>Inventory and map priority areas with non-native, invasive plant species.</p> <p>Provide habitats to support desirable levels of selected species.</p> <p>Use fire to restore and maintain fire dependant and associated communities.</p> <p>Engage the public and other agencies in cooperative, collaborative efforts that win their trust and support while helping to meet desired future conditions.</p> <p>Encourage cooperation and partnerships with individuals, non-profit organizations, other agencies, special interest groups, clubs and others to achieve the Forest's interpretive activities.</p>	2.1, 16.1 – 16.6	2-10, 2-49, 2-53, 2-56, 2-72
Reduction of SBP Risk	<p>Manage existing forest communities to reduce risks from insects and disease.</p> <p>Provide habitats to support desirable levels of selected species.</p> <p>Engage the public and other agencies in cooperative, collaborative efforts that win their trust and support while helping to meet desired future conditions.</p> <p>Encourage cooperation and partnerships with individuals, non-profit organizations, other agencies, special interest groups, clubs and others to achieve the Forest's interpretive activities.</p>	16.1, 16.16.4, 16.6	2-10, 2-49, 2-72
Reforestation	<p>Manage existing forest communities to reduce risks from insects and disease.</p> <p>Provide habitats to support desirable levels of selected species.</p> <p>Use fire to restore and maintain fire dependant and associated communities.</p> <p>Engage the public and other agencies in cooperative, collaborative efforts that win their trust and support while helping to meet desired future conditions.</p> <p>Encourage cooperation and partnerships with individuals, non-profit organizations, other agencies, special interest groups, clubs and others to achieve the Forest's interpretive activities.</p>	16.1 – 16.6	2-10, 2-53, 2-72
Site Preparation	<p>Manage existing forest communities to reduce risks from insects and disease.</p> <p>Provide habitats to support desirable levels of selected species.</p> <p>Achieve a balance between suppression, to protect life, property, and resources, and fire use, to regulate fuels and maintain healthy ecosystems. Use wildland fire to protect, maintain, and enhance resources, and, as nearly as possible, allow fire to function in its natural ecological role.</p> <p>Use fire to restore and maintain fire dependant and associated communities.</p> <p>Reduce hazardous fuels through use of wildland fire, prescribed fire, and mechanical fuels treatment.</p>	16.1 – 16.6	2-10, 2-49, 2-53, 2-56, 2-72

Action	Goal(s)	Objective(s)	Pages
	<p>The National Forests will manage areas to provide for "backcountry" (semi-primitive/remote) recreation experiences.</p> <p>Engage the public and other agencies in cooperative, collaborative efforts that win their trust and support while helping to meet desired future conditions.</p> <p>Encourage cooperation and partnerships with individuals, non-profit organizations, other agencies, special interest groups, clubs and others to achieve the Forest's interpretive activities.</p>		
Right-of Way Needs	<p>Identify and acquire easements and/or rights-of-way for existing forest roads and access needs.</p> <p>Engage the public and other agencies in cooperative, collaborative efforts that win their trust and support while helping to meet desired future conditions.</p>		2-38, 2-72

1.4 Desired Condition

The stands are dominated by longleaf pine seedlings, well stocked and spaced with approximately 400 seedlings per acre. Thinned stands have an open park-like appearance with an average basal area of approximately 40 to 60 square feet per acre. Residual over-story longleaf and shortleaf pine trees and selected mast producing hardwoods occur in young stands and in thinned stands. Residual trees may be either scattered or clumped. Non-native invasive species are reduced in the project area.

1.5 Proposed Action

The Tuskegee National Forest in Macon County Alabama is proposing to restore approximately 796 acres from 'off-site' species to longleaf pine, commercially thin approximately 337 acres of loblolly and slash pine, control non-native invasive species, and precommercially thin approximately 40 acres of loblolly pine sites over the next 5 years. This is the initial phase of a long-term project that is designed to improve the health of the Tuskegee National Forest.

Proposing the use of clearcutting with reserves as described in the revised forest plan to restores these areas to Longleaf Pine.

Based on the desired future conditions and the need to provide early successional habitat and maintain habitat diversity, the clearcutting with reserve trees regeneration method is the optimum method for longleaf restoration. Suitable seed source for the desired species, longleaf pine, is not present. The existing dominant species, loblolly pine, is a prolific seeder with aggressive initial growth characteristics. Longleaf pine is a highly shade-intolerant species. Natural regeneration methods either even-aged or uneven-aged cannot provide for longleaf regeneration and would result in excessive competition if underplanting or other methods were used to establish a longleaf component. Clearcutting removes the loblolly seed source and provides appropriate light conditions.

- **Restore the Longleaf Pine Ecosystem on Selected Sites:**
 - **Harvest** loblolly and slash pines on selected sites, approximately 796 acres, where this species is ‘off-site’ by clearcutting with reserves. Reserves are trees will be left where available, specifically longleaf and shortleaf pines, relic trees (remnant/leftover trees from an earlier stand usually much older and larger than the trees of the current stand), and mast producers of sufficient size. Retain snags in according with Forest Plan standards. ‘Off site’ as used here means trees growing in a location that is better suited for another species’. Although loblolly and slash pines will grow in most locations on the Tuskegee National Forest, they thrive in moist locations, but do not grow well in deep, dry sandy soils as longleaf pine does.
 - **Site preparation** on approximately 796 acres, restoration sites, using the methods as listed in Table A.4-1. Methods will vary and are prescribed according to the existing stand conditions. After harvesting, stands will be reevaluated for site prep needs to determine if the initial site prep prescription remains valid. If changes in site prep treatments are needed, appropriate decisions will be made at that time.
 - **Plant longleaf** pine on approximately 796 acres.
- **Commercial Thinning:**
 - Thinning on approximately 337 acres to reduce overstocking and remove diseased trees. Young stands of loblolly with density greater the 80 square feet of Basal area per acre will be thinned to reduce the risk of SPB. Older stand with stocking greater than 90 sq. ft of BA per acre will also be thinned to carry these stands until they can be restored.
- **Nonnative Invasive Species Control:**
 - The Tuskegee District proposes to control invasive plant species by treatment with chemicals (herbicides) or with a combination of mechanical and chemical (herbicide) treatments. Areas that will receive treatment within the project area (Compartments 4, 5, 8, 9, 10, 13, 14, 15, and 18) are areas where non-native, invasive plants are established. Treatment areas would include but not limited to roadsides, recreation areas, trails, trailheads, old roadbeds, fire lines, stream banks, wildlife openings and selected areas of infestations within the Forest.
 - Targeted nonnative plants will be treated with selective herbicides, Table 1.5-2, while avoiding or minimizing application to desirable plants. It is anticipated that many of the areas with invasive plants would need to have an initial treatment with one or more follow up treatments over a minimum period of five years. The number of follow up treatments depends upon how well the plants are established and the persistence of the plants. The treatment method depends upon the physical location of the plant including surrounding vegetation, the physical size of the plant, and the vigor of the plant, the plant species and the time of year the treatment is applied.

The following types of manual herbicide treatment methods are proposed:

- **Directed Foliar Sprays** – herbicide-water sprays, often with a non-ionic

surfactant added, aimed at the target plant foliage to cover all leaves to the point of run off. They are usually applied with a backpack sprayer and plants up to six feet tall can be treated with this equipment.

- **Cut Surface Treatment**
 - **Stem Injection (including hack-and-squirt)** – herbicide mixtures or concentrates applied into downward incision cuts spaced around wood stems made by an ax, hatchet, machete, brush ax or tree injector. Injection is a selective method of controlling trees and shrubs, which are greater than 2 inches in diameter.
 - **Cut Stump** – herbicide concentrate or mixtures applied to the outer circumference of freshly cut stumps or the entire top surface of cut stems. Cutting the woody stems is usually accomplished by chainsaw or brush saw, but may be accomplished by handsaws or other hand-held cutting equipment. Herbicide is applied with a backpack sprayer, spray bottle, wick applicator or paintbrush.
- **Basal Applications**
 - **Full Basal Sprays** – herbicide-oil-penetrant mixtures sprayed or daubed onto the lower portion of woody stems of trees or shrubs. They are applied using a backpack sprayer or a wick applicator, and are effective in controlling woody stems up to 6 inches in diameter.
 - **Modified Basal Sprays** (streamline or thinline) - herbicide-oil-penetrant mixtures sprayed onto the lower portion of woody stems of trees or shrubs with a diameter of 2 inches or less.

Table 1.5-1: Some herbicide mixtures to control specified non-native invasive species found on the Tuskegee National Forest.

NONNATIVE SPECIES	HERBICIDE MIX
Kudzu	Transline – 0.5 %
Cogongrass	Accord – 2%, Arsenal – 1%
Chinese Wisteria	Garlon 4 – 4%, Transline - .5%, Accord – 2%
Multiflora rose	Escort, Arsenal AC -1%, Accord
Japanese climbing fern	Garlon 3A/Garlon 4 – 2%, Accord – 2% Arsenal AC 1%
Chinese privet	Accord – 3%
Mimosa / Silktree	Garlon 3A (Large trees) Garlon 4 – 20% Saplings Garlon 3A/Garlon 4 (resprouts/seedlings)
Princess Tree/Royal Paulowina	Arsenal AC (Large trees) Garlon 4 – 20% Saplings Garlon 3A/Garlon 4 – 2% (resprouts/seedlings)
Serecia lespediza	Garlon 4
Bicolor lespediza	Garlon 4

The use of mechanical methods to treat the invasive plant species would be used in conjunction with the herbicide treatments. Examples would include, but are not limited to, using a chainsaw

to cut stems for the cut stump treatment method or using brush saws or string trimmers to reduce infestation densities to improve herbicide uptake and effectiveness. Mowing and prescribe burning infestations will be used depending on species of plant, size and age of infestation and time of year the treatment will take place. In areas where invasive non-native species occur (i.e. kudzu, privet, etc.), long-term (3-5 years) measures such as herbicide applications, bulldozing, mowing, weedeating and prescribed fire may be needed for control and/or eradication of these plants. Table 1.5-2 below lists known areas of non-native invasive species in the Project Area.

Table 1.5-2: Areas containing non-native invasive species (NNIS).

Compartment	Stand	Target Species
4	1	Serious NNIS – all 10 target species present
4	2	Serious NNIS – All 10 target species present
5	6	Kudzu, Sericea, Mimosa, Bicolor, Japanese Climbing Fern
5	23	Mimosa, Kudzu
8	all	Privet, Kudzu, Sericea, Bicolor
10	7	Mimosa, Kudzu, Bicolor, Sericea, Japanese Climbing Fern
14	3	Mimosa
15	5	Privet
15	3	Privet
15	14	Privet

- **Precommercial Thinning:**

- Precommercial thinning on approximately 40 acres of overstocked young pine stands.

Connected Actions

Wildlife Habitat Improvement:

Connected actions that are not a part of the decision to be made, but are part of the overall strategy to address forest health in this planning period are: Prescribed burning, particularly during the growing season, would promote native ground cover and help restore and maintain habitat conditions for game species and songbirds. The effects of these connected actions, although analyzed in separate documents are considered in this analysis.

1.6 Scope of the Environmental Analysis

For the purpose of this analysis, the project area is considered as the area encompassed by compartments 4, 5, 8, 9, 10, 13, 14, 15, and 18 of the Tuskegee National Forest. This represents about 48% of the total land base.

This analysis is site specific to the project area. A list of the individual stands proposed for treatment is located; along with maps of the project area is included in Appendix A. The Revised Land and Resource Management Plan for the National Forests in Alabama is incorporated by reference in this EA.

This EA also include the biological evaluation (BE) of Threatened and Endangered species and of the Regional Foresters Sensitive Species (Appendix B). Current conditions, potential affects of the alternatives are considered in detail, and mitigation measures are discussed in the following chapters of the document.

1.7 Public Involvement

The proposal was provided to the public and other agencies for comment during scoping February 26, 2004. In addition, as part of the public involvement process, the agency proposed a field trip for interested publics to view examples of the need for the proposed action. Only one of our interested publics took advantage of the tour.

Using the comments from the public, and other agencies, the interdisciplinary team developed a list of issues to address.

1.8 Issues

An issue is a point of discussion, debate, or dispute about the projected environmental effects of an activity. Issues may arise at any time during the analysis and originate from any source. During the scoping process, issues are clarified, refined, and classified as to their relevance to the current analysis. Per CEQ and FS guidance, the key issues that are “significant” and deserving of detailed study must be identified. The other remaining issues, which are not as pertinent to the current analysis, may be dropped from further discussion once addressed or included in the analysis serving a lesser role than the key issues.

The Forest Service separated the issues into two groups: significant and non-significant issues. Significant issues were defined as those directly or indirectly caused by implementing the proposed action. Non-significant issues were identified as those: 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. The Council on Environmental Quality (CEQ) NEPA regulations require this delineation in Sec. 1501.7, “...identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)...” The Tuskegee National Forest uses [six](#) broad-based categories with sub-categories to classify potential issues. These categories are:

1. **Soil Productivity**
 - a. Erosion
 - b. Compaction
2. **Water Quality**
 - a. Sedimentation
 - b. Herbicides
 - c. Wetlands, Floodplains, and Riparian Areas
 - d. Cumulative impacts
3. **Air Quality**
4. **Vegetation**

- a. Restoration of Off-site species
 - b. Age-class distribution
 - c. Understory diversity
 - d. Southern Pine Beetle
 - e. Non-native Invasive species
5. Wildlife
- a. MIS Habitat
 - b. Threatened, Endangered and Sensitive Species
 - J. TES animals
 - K. TES plants
6. Social and Economic
- a. Economics
 - b. Recreation
 - J. Recreation Settings
 - K. Scenic integrity
 - c. Heritage Resources
 - d. Public Health and Safety
 - e. Civil Rights and Environmental Justice

Some comments may not fall within these categories and are classified as “other” or “out of the scope of the project.” Generally “other” issues are those that may have some relation to the project but are administrative-, financial-, or process-related and, consequently, do not have a cause-and-effect relationship to the project’s environmental impacts. Issues “out of the scope” may or may not have a cause-and-effect relationship, but decisions related to them are: Outside the agency’s authority; addressed at the national or forest planning levels and, therefore, not appropriate for examination in a project-level analysis; or below the measurement threshold when compared to larger-scale relationships. Issues are listed in the “out of the scope” category only if they do not relate to the 6 basic issue categories. Otherwise, they are listed in the related-issue category and described as “out of the scope” in the narrative.

Twelve issues identified for this project are discussed below. See the project file for ID Team meeting and issue development notes.

Significant Issues

Issue 1 - Will the proposed activities cause sediment or contamination in the streams and have adverse effects on federally listed species. (2a, 2d, 5b – sediment, aquatic habitat, TES species)

The purpose of this Environment Assessment (EA) is to analyze and disclose the environmental consequences of the proposed actions and alternatives to that proposal (EA page 1). The disclosure of effects to water quality and aquatic habitat is located in chapter three of the EA. The disclosure of effect to aquatic T & E species is in the Biological Assessment (BA).

This proposed action implements the Revised Forest Land and Resource Management Plan (Revised Plan) and includes appropriate standards mitigating measures to reduce or eliminate

effects to the environment. Prior on-site monitoring/inspections on national forest lands in Alabama continue to confirm that adherence to standard mitigation measures provide adequate protection for water quality, aquatic habitat and aquatic T & E species.

Issue 2 – Would requiring the use of specialized equipment do a better job of protecting the soils? (2a – Water Quality, sedimentation)

This EA analyses and discloses the effects of the proposed actions and alternatives on water quality and sedimentation (EA chapter 3) using traditional equipment. The analysis determined that with appropriate standards (RLRMP), the effects are mitigated to acceptable levels. As technology develops, newer equipment will become available to implement proposed actions such as this one. The new technology may produce desired results with the similar or less effects to the environment. The use of specialized equipment that has similar or less effects on the environment is not prohibited in this decision. However, an alternative was developed that included the use of specialized equipment to address this issue (alternative 6), and is discussed in chapter 2 of this EA.

Issue 3 – Would alternatives with varying levels of road closure and obliteration provide better protection to the resources particularly water? (2a – Water Quality, sedimentation)

The purpose of this Environment Assessment (EA) is to analyze and disclose the environmental consequences of the proposed actions and alternatives to the proposal (EA page 1). The disclosure of effects to water quality and aquatic habitat is located in chapter three of the EA. As a part of this analysis, a roads analysis was completed for the treatment area and is located in the project file. However, district-wide road closure and obliteration is not a part of this proposed action and this issue suggests that it should be. In order to address this issue alternative 9 was developed to consider district-wide road closure and obliteration and is discussed in chapter 2 of this EA.

Issue 4 – Will the proposed action and alternatives have adverse effects on PETS and MIS? (5a, 5b – MIS, TES)

The purpose of this Environment Assessment (EA) is to analyze and disclose the environmental consequences of the proposed actions and alternatives to that proposal (EA page 1). The disclosure of effects to MIS is located in chapter three of the EA. The disclosure of effect to TES is located in the BA.

Issue 5 - Can the purpose and need of this project be met without regenerating stands at this time? (4b Age-class Distribution)

A concern was raised that no alternative was developed, that met the purpose and need for the project but did not propose regeneration treatments at this time. To address this issue, an alternative was developed with thinning treatments only, i.e. no regeneration treatments. Alternative 4 is detailed in chapter 2 and analyzed in chapter 3 of this document. In addition, an alternative was developed that regenerates fewer acres (Alternative 10) and is discussed in Chapter 2 of this EA.

Issue 6 – Will the use of herbicides adversely affect water quality and non-target species? (2b – water quality, herbicides)

The purpose of this Environment Assessment (EA) is to analyze and disclose the environmental consequences of the proposed actions and alternatives to the proposal (EA page 1). The disclosure of effects to water quality and non-target species is located in chapter three of the EA.

In addition, to further address this issue, an alternative (Alternative 3) was developed with no herbicide treatment. The effects of Alternative 3 are discussed in chapter 3, Environmental Consequences, of the EA.

Issue 7 – Does this proposal adequately address the forest health issue when there are more areas that have restoration needs across the forest that are not proposed here? (4b – Vegetation, age class distribution)

The proposed actions in this EA address the forest health, restoration and maintenance needs in compartments 4, 5, 8 - 11, 13-15, and 18 of the Tuskegee National Forest. To address this issue an alternative was developed and is discussed in chapter 2, which restores more acres (Alternative 5).

Issue 8 – Are archaeological sites adequately protected? (6c- heritage resources)

The purpose of this Environment Assessment (EA) is to analyze and disclose the environmental consequences of the proposed actions and alternatives to the proposal (EA page 1). The disclosure of effects to cultural resources is located in chapter three of the EA.

Standard mitigation measures for the protection of Archaeological resources including the systematic survey of all areas prior to ground disturbing activities are included in this proposed action. Review of similar projects on the National Forests in Alabama have shown that these Revised Plan standards are adequate to protect heritage resources (FEIS RFLRP Chapter III pp. 3-332 to 3-338)

Issue 9 – What are the effects of this project on Old Growth and late successional habitat? (4b – age class distribution)

The purpose of this Environment Assessment (EA) is to analyze and disclose the environmental consequences of the proposed actions and alternatives to that proposal (EA page 1). The disclosure of effects to major community types including early and late successional habitats and old growth is located in chapter 3 of the EA. Stands exhibiting old growth characteristic were not selected for treatments in the proposed action or the alternatives. Additionally, effects to age-class distribution of the treatment area are also discussed in Chapter 3 of the EA.

Issue 10 – Will implementation of this project cause damage to soils? (1a – Soil)

The purpose of this Environment Assessment (EA) is to analyze and disclose the environmental

consequences of the proposed actions and alternatives to the proposal (EA page 1). The disclosure of effects to soil productivity is located in chapter three of the EA.

This proposed action implements the Revised Forest Land and Resource Management Plan (Revised Plan) and includes appropriate standards mitigating measures to reduce or eliminate effects to the environment. Prior on-site monitoring/inspections on national forest lands in Alabama continue to confirm that adherence to standard mitigation measures provide adequate protection for soil productivity.

Non-significant Issues

Issue 11 – Can the purpose and need be met by an alternative that does not include commercial timber sales? (Other)

This issue falls in the category of “other” because it does not have a cause and effect relationship to the effects on the environment but rather is administrative in character. However, an alternative was developed (Alternatives 7 & 8) to address this issue and is discussed in chapter 2 of the EA.

Issue 12 – Are baseline population surveys for MIS necessary to monitor the effects of this project and to monitor population trends? (Outside of the Scope)

This issue is outside of the scope of this decision. Management Indicator Species (MIS) are selected during Forest Planning (at the forest level) to help compare the effects of the Forest Plan Alternatives. MIS are monitored at the forest level and not at the project level. Additional information regarding the use of MIS can be found in the Process Record for the FEIS Revised Forest Land and Resource Management Plan. (FEIS, RLMP, Appendix B).

1.9 Decision to Be Made

The District Ranger of the Tuskegee National Forest is the public official responsible for deciding, based upon this analysis, what actions will be taken to meet the purpose and need for the action for the project area. The decision to be made is: to what extent, if any, should the propose longleaf ecosystem restoration and maintenance efforts be implemented in the project area. The options include, in whole or in part, the four alternatives that have undergone analysis. Full descriptions of these alternatives are provided in Chapter II. Maps and tables detailing site-specific treatment are located in Appendix A. In summary, the four alternatives are:

Alternative 1 – No Action: No management activities would be taken in the project area to restore and maintain the longleaf ecosystem.

Alternative 2 – The Proposed Action: Restore approximately 796 acres from ‘off-site’ species to longleaf pine, commercially thin approximately 337 acres of loblolly and slash pine, control non-native invasive species, and pre-commercially thin approximately 40 acres of loblolly pine sites over the next 5 years.

Alternative 3 - No Herbicide: Restores approximately 796 acres of upland forestland to longleaf pine, commercially thins approximately 337 acres of upland pine and pre-commercially thins approximately 40 acres of upland pine sites over the next 5 years. No herbicides would be used for site preparation, or for control of non-native invasive species.

Alternative 4 – Thinning Only/No Regeneration: Thinning only, to accomplish restoration of 450 acres within the longleaf pine ecosystem of the Tuskegee National Forest occurring over 2 years.

2.0 Mitigation Common to All Alternatives

Mitigation measures that are common to all of the alternatives are listed by page number as in the RLRMP or reference source in Table 1.9-1 below.

Table 2.0-1: Mitigation measures common to all Alternatives.

Area of Concern	Mitigation (RLRMP page #)
Soil Water & Air	2-19 – 2-21
Major Habitat Groups	2-10 – 2-12
Rare Communities	3-42, 3-44, 3-53 - 3-55, 3-57
Terrestrial Habitats	2-50 – 2-51
T & E Species	2-30 – 2-34
Old Growth	Guidance for Conserving and Restoring Old growth Forest Communities on National Forests in the Southern Region (USDA 1997)
Herbicide Use	2-12 – 2-13
Non-native Invasive Species	N/A
Recreation	2-56 – 2-58
Transportation System	See Soil, Water & Air, Recreation, Terrestrial Habitats, Rare communities in this table.
Fire Management	2-54, 2-55
Heritage Resources	2-62 – 2-63
Riparian Areas	2-2, 3-58

Chapter 2

2.0 Alternatives

Range of Alternatives Considered

This section describes and compares the alternatives considered for the Tuskegee Forest Health and Longleaf Pine Restoration project. It includes a description of each alternative considered. The maps for each Alternative are located at the rear of the document. This section also presents the alternatives in comparative form, sharply defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public. Some of the information used to compare the alternatives is based upon the design of the alternative (i.e., helicopter logging versus the use of skid trails) and some of the information is based upon the environmental, social and economic effects of implementing each alternative (i.e., the amount of erosion or cost of helicopter logging versus skidding).

2.1 Alternatives, Considered in Detail

Alternative 1 (No Action)

Under the No Action alternative, current management plans would continue to guide management of the project area. No longleaf restoration activities such as clearcutting of off-site loblolly and slash pine stands to plant longleaf, thinning of overstocked loblolly and slash stands (SPB risk reduction), harvesting of loblolly stands affected by loblolly pine dieback would be implemented to accomplish project goals. Prescribe burning would continue. Improvement of wildlife habitat through vegetative manipulation would not occur. An opportunity to improve forest health will have been lost for the Tuskegee National Forest.

Alternative 2 (Proposed Action)

The Tuskegee National Forest in Macon County Alabama is proposing to restore approximately 796 acres of upland forestland to longleaf pine, commercially thin approximately 337 acres of upland pine and precommercially thin approximately 40 acres of upland pine sites over the next 5 years. This is the initial phase of a long-term project that is designed to improve the health of the Tuskegee National Forest.

Restoration cuts, thinnings and precommercial thinnings during the first 5 years are proposed for selected loblolly and slash pine stands in compartments 4, 5, 8, 9, 10, 11, 13, 14, 15 and 18. Affected stands are listed in Appendix A of this EA.

Many stands receiving restoration cuts will have reserve trees (longleaf and shortleaf pines) left in the stand. Relic longleaf and shortleaf pines will be marked and retained. Mast producing trees of sufficient size will be left for wildlife purposes. In thinning stands, the residual basal area will be approximately 40 to 60 square feet per acre.

Site preparation is the process of exposing mineral soil or reduction of woody or grassy vegetative competition to increase the probability of successful natural or artificial regeneration of a stand. Site prep will be needed in the restoration stands and may be intensive depending on site needs. Invasive non-native vegetation will be treated for control and/or eradication where it occurs. To prepare sites for restoration to longleaf pine, activities may include any one or a combination of the following types of site preparation techniques: roller drum chopping or other mechanical brush control methods (i.e. chainsaw), herbicide application and/or prescribed burning. Herbicides used for site preparation would be used on a grid pattern, except where invasive non-native vegetation occurs. For the treatment of invasive non-native vegetation and site preparation, herbicides application would be by foliar, basal and/or hack and squirt methods.

Alternative 3 (No Herbicide Alternative)

Implementation of Alternative 3 restores approximately 796 acres of upland forestland to longleaf pine, commercially thins approximately 337 acres of upland pine and precommercially thins approximately 40 acres of upland pine sites over the next 5 years. No herbicides would be used for site preparation.

Invasive non-native vegetation will not be treated for control and/or eradication where it occurs with herbicides. Control will be mechanical such as mowing and the use of hand tools to cut, chop and grub out roots where feasible.

Restoration cuts, thinnings and precommercial thinnings during the first 5 years are proposed for selected loblolly and slash pine stands in compartments 4, 5, 8, 9, 10, 11, 13, 14, 15 and 18.

Many stands receiving restoration cuts will have reserve trees (longleaf and shortleaf pines) left in the stand. Relic longleaf and shortleaf pines will be marked and retained. Mast producing trees of sufficient size will be left for wildlife purposes. In thinning stands, the residual basal area will be approximately 40 to 50 square feet per acre.

To prepare sites for restoration to longleaf pine, activities may include any one or a combination of the following types of site preparation techniques: roller drum chopping or other mechanical brush control methods (i.e. chainsaw) and/or prescribed burning.

Alternative 4 (Thinning Only)

Alternative 4, proposes thinning only, to accomplish restoration of 450 acres within the longleaf pine ecosystem of the Tuskegee National Forest occurring over 2 years. Thinning is an intermediate cutting. Its purpose is to reduce the number of trees per acre, allowing the remaining trees to have less competition for light, moisture and nutrients. This causes an increase in growth on the crop trees.

This alternative would be implemented in the following pine stands containing 80 square feet of basal area per acre and higher.

Table 2.1-1 Thinning Only Stands

Compartment	Stand	Acres	Pine BA	Hardwood BA	Total BA
4	14	25	80	3	83
5	4	21	92	10	102
5	23	20	190	0	105
8	20	14	90	10	100
10	7	46	103	0	103
10	9	13	90	0	90
10	13	6	150	0	150
10	16	11	120	0	120
10	18	11	110	0	110
11	8	11	90	40	130
13	6	57	86	16	102
13	7	29	100	0	100
13	30	24	180	0	180
14	5	61	110	0	110
15	11	16	163	3	166
15	14	16	95	3	98
15	19	19	180	0	180
18	15	36	120	0	120
18	17	14	80	0	80
Total Acres		450			

Residual basal area will vary from 40 to 60 square feet per acre. Mast producers 9 inches and greater will be protected for wildlife forage.

Herbicides will not be used in this alternative to control nonnative invasive plants.

In stands with longleaf/shortleaf trees, these trees will be left. Any regeneration of longleaf pine will occur from within the thinned stand and adjacent stands, if there is an adequate seed source.

Comparison of Alternatives

This section provides a summary of the effects of implementing each alternative. Information in the table is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

Table 2.1-2: Comparison of Alternatives.

	Alt. 1 No Action	Alt. 2 Proposed Action	Alt. 3 No Herbicide	Alt. 4 Thinning Only
Soil, Water & Air	Little to no soil movement. Water quality remains the same. Prescribed burns continue.	Some soil movement. Water quality remains the same. Prescribed burns continue.	Some soil movement. Water quality remains the same. Prescribed burns continue.	Some soil movement. Water quality remains the same. Prescribed burns continue.

Table 2.1-2: Comparison of Alternatives by effects (continued).

	Alt. 1 No Action	Alt. 2 Proposed Action	Alt. 3 No Herbicide	Alt. 4 Thinning Only
Major Habitat Groups	Longleaf Ecosystem not restored. Continued SPB hazard. Loss of oak dominance. Loss to disease continues. Understories dense and woody, few containing grasses.	Longleaf Ecosystem restored. Reduced SPB hazard. Oak dominance may increase. Reduced losses to disease. Produces grassy understories.	Longleaf Ecosystem restored. Reduced site prep quality. Potentially higher seedling mortality. Reduced SPB hazard. Oak dominance may increase. Reduced losses to disease. Produces grassy understories.	Longleaf Ecosystem not restored Possibility of regeneration to longleaf pine is low Reduced SPB hazard Oak dominance may increase Reduced losses to disease May produce grassy understories
Rare Communities	Losses due to reduced management and maintenance opportunities.	Opportunity to maintain and improve communities.	Reduced opportunity to maintain and improve communities.	Reduced opportunity to maintain and improve communities.
Terrestrial Habitats	Continued poor quality habitat. No early successional habitat produced.	Improved habitat quality. Creates early successional habitat.	Improved habitat quality. Creates early successional habitat.	Improves habitat quality. Early successional habitat not produced.
T & E Species	Loss from encroachment of competing vegetation	Opportunity to increase populations	Opportunity to increase populations	Reduced opportunity to increase populations
Old Growth	Possible loss from insects.	Reduced probability of loss.	Reduced probability of loss.	Reduced probability of loss.
Herbicide Use	Not used. No effects	Potential to hit non-target plants.	Not used. No effects	Not used. No effects
Non-native Invasive Species	Continued expansion in quantity and coverage.	Opportunity to eradicate and control.	Continued expansion in quantity and coverage. No opportunity to control.	Continued expansion in quantity and coverage. No control.
Recreation	Aesthetics may be reduced.	Aesthetics reduced in the short term. Improved over time.	Aesthetics reduced in the short term. Improved over time.	Aesthetics reduced in the short term. Improved over time.
Transportation System	Loss of road quality. Minimal maintenance. May close more roads. No new roads constructed.	Improved road quality. More maintenance. No new roads constructed.	Improved road quality. More Maintenance. No new roads constructed.	Some improved road quality. Slightly more road maintenance. No new roads constructed
Prescribed Fire	Will continue. Growing season burning will be limited. Produces limited grassy understories.	Will continue. Growing season burning will be increased. Produces open park-like understories.	Will continue. Growing season burning will be increased. Produces open park-like understories.	Will continue. Growing season burning will be increased. Some open park-like understories.
Heritage Resources	No affects.	Probability of affecting a site is low	Probability of affecting a site is low	Probability of affecting a site is low

2.2 Alternatives Considered but Eliminated from Detailed Study

Of the 10 alternatives considered in the analysis, 6 were dropped from detailed study. Alternatives 5-10 were formulated to address specific issues and concerns, however they do not meet the purpose and need for this action, achieve the objectives of the project area, or are not reasonable. Descriptions of these alternatives and how they were developed can be found in the project file.

Alternative 5 - Restore more acres

Over 3000 acres of pine stands on the Tuskegee National Forest have been identified as being off site. Of this, approximately 1700 have been inventoried at this time and approximately 1600 acres are classified as off site species. Alternative 5 recommends that all the stands inventoried, approximately 1600 acres, which were classified as off site would be restored this 5 year period. Herbicides would be used for the control and eradication of invasive nonnative species, and site prep along with mechanical treatments and prescribed burning.

Given the current staffing of the district, current district budget allocations, and no likely relief in the near future of these constraints, this alternative is not reasonable at this time.

Alternative 6 – Use of Specialized Equipment

This alternative responds to an issue concerning limiting timber harvest equipment to specialized equipment, specifically a cut-to-length harvest system on the basis that it would minimize impacts on soil productivity and water quality.

This proposed action implements the Revised Plan and includes appropriate standards and mitigating measures to protect soil productivity and water quality, with the use of traditional equipment. The extensive analysis of potential soil and water impacts conducted during Forest Planning and the site specific analysis of soil types and hydrology conducted for this project indicate that if standard harvest practices are employed (typically cutters and grapple skidders), impacts on soil and water would be well below the allowable level necessary to maintain site productivity and water quality. For this reason, there was no cause and effect relationship to compare against standard thresholds, and cut-to-length, low PSI and animal harvest systems are representative of implementation methods and not alternatives with substantially different effects appropriate for detailed analysis under an additional alternative.

Cut-to-length and other alternate logging systems are not precluded under any of the action alternatives developed in detail. Where terrain and material size are compatible with these methods, purchasers have the option to use them. In addition, the Tuskegee Ranger district will employ substantial safeguards to insure that standards are met under any harvest system appropriate for this project.

- Water quality issues are a result of soil impacts resulting in movement and project design which provides oversight to ensure soil impacts are maintained within standards. It is the responsibility of the contracted logger to provide and use whatever equipment is necessary to ensure residual stand protection. Standards for erosion control, wet weather logging and other essential requirements are written into the timber sale contract.
- Forest plan standards related to buffer strips and SMZs will be inherent to the design of the project.
- A Forest Service Representative (FSR) examines Sale areas frequently during all harvest operations to ensure that contract provisions are being met. If unacceptable damage is occurring, the FSR has the right and responsibility to take whatever measures are necessary to prevent further damage, including halting logging operations.

Because of the nature of the soil and terrain and implementation of Forest Plan standards, there was no reasonable basis for the detailed development of an additional alternative when all standards would be met with all standard logging practices including cut-to-length.

Alternative 7 - Ecosystem Restoration without Sale of Timber

In response to public comments, an alternative was developed which would allow for the restoration of the native diversity and species and improve forest health without conducting a timber sale. Restoring the native longleaf pine on sites now occupied by loblolly and slash pine requires that the overstory trees be felled to reduce loblolly and slash seeding and provide the sunlight necessary for longleaf seedling development. Reduction of southern pine beetle risk also involves the felling of trees.

To evaluate this option we assumed a cost of \$150 per MBF to fell the trees, dispose of them with a whole-tree chipper, and spread the chips evenly through the stands. Multiplying this by the approximate 38,000 MBF or 23,000 CCF in the "Original Proposed Action" produces a cost of \$ 3,450,000. This cost would fall entirely on the tax payers of the United States, as would the cost of cultural treatments needed to meet the purpose of the project. These cultural treatments, including site preparation and planting, are generally funded by the Knutson-Vandenburg Fund, which uses moneys from a timber sale to reforest the sale area. The Tuskegee National Forest is not currently allocated that much money for ecosystem restoration on a project-by-project basis. Such an alternative may also be outside the intent of the law, since both the National Forest Management Act (NFMA) and the Resource Planning Act (RPA) provide utilization language for timber harvested on the National Forests. For these reasons, this alternative was considered unreasonable and was eliminated from further analysis.

Alternative 8 - Restoration using Stewardship Contracting

The type of legal instrument (contract) for accomplishing the work depends on many factors such as value, product emphasis, road needs, type of project and total volume. This is accomplished after the timber cruise is completed and the timber value has been appraised.

To use Stewardship Contracting/Service Contracts is outside of the scope of the decision to be made. The decision to be made is whether or to implement the Forest Health and Longleaf Pine Restoration Project.

Alternative 9 – Road Closure and Obliteration Alternative

This alternative responds to an issue on the use of road closure and obliteration to protect water quality. The proposed action is primarily a vegetation management action, not an infrastructure project. As a part of this analysis process, a roads analysis was completed for the treatment area and is located in the project file. The roads analysis indicated that the road system in this treatment area is appropriate for restoration and maintenance activities proposed, and that addition road closure and obliteration is not necessary at this time.

Because this is not primarily an infrastructure project, district-wide road closure and obliteration is not within the scope (EA page 14) of this project. In addition, during project planning, roads analysis should consider the project area. It is not reasonable to consider roads outside of the project area in this analysis.

Alternative 10 - Restore fewer acres

Under this alternative, only 319 acres would be restored in this 5 year period. Stands chosen for this action are off-site and have a basal area (BA) less than 60 square feet per acre. This figure is typically the lower limit of well stock-stocked stands. The proposed stands range from 16 to 53 BA. Applying silvicultural standards for stocking, these stands are poorly stocked. Herbicides would be used to control/eradicate nonnative invasive species and site prep in conjunction with mechanical treatments. Roller drum chopping and prescribed burning are also used for site prep and for fuel reduction.

Restoring fewer acres will not meet the restoration goals and objectives of the RLMRP, the SPB hazard will still be high, and Loblolly Decline will continue. This alternative produces 60% less acres of restored to native ecosystems than Alternative 2 over 5 years. This reduction increases the amount of time required to restore the off-site species on the Tuskegee National Forest and does not meet the purpose and need for this proposed action.

Chapter 3

Effects Analysis

This section summarizes the physical, biological, social and economic environments of the affected project area and the potential changes to those environments due to implementation of the alternatives. It also presents the scientific and analytical basis for comparison of alternatives presented in Chapter 2.

3.A Physical Elements

3.A.1 Soil Resources

Issues

No issues identified.

Affected Environment

Soils within the boundaries of the Tuskegee National Forest are located in the Upper Hills Subsection. Within this subsection, soils are located in two landtype associations (LTAs): Tuskegee Hills and Uphappe Creek. The Tuskegee Hills LTA consists of upland ridges of low relief. Surface terrain is nearly level to sloping with short steep side slopes. Soils are derived from a mixture of marine sediments composed of gravelly fine and coarse sands and clay. Soils are deep, well drained, slowly to moderately permeable with sandy clay loam subsoils. Past agriculture has resulted in severe erosion over most of the forest resulting in loss of soil surface horizons and formation of numerous gullies and rills. Restoration of gullies in the 1950's has reshaped the landscape. Healed rills can be found throughout the forest. Uphappe Creek LTA consists of floodplains and terraces of very low relief. Surface terrain is nearly level to gently sloping. Sediments from adjacent uplands can be found within floodplains. Wetlands (hydric soils) are commonly found. Soils derived from recent fluvial and low terrace deposits. Soils are deep, poorly to moderately permeable with sandy loam, sandy clay loam, and clay subsoils.

An Order 2 soil resource inventory identified 14 soil resource inventory map units within the proposed project boundary identified as;

- Bethera clay loam, 0% - 1% slopes, frequently flooded
- Bibb-Chastain complex, 0% - 1% slopes, frequently flooded
- Bigbee loamy sand, 1% - 3% slopes, rarely flooded
- Cowarts loamy sand, 1% - 5% slopes
- Cowarts sandy loam, 5% - 12% slopes, eroded
- Cowarts-Uchee Complex, 12% - 25% slopes, eroded
- Dothan sandy loam, 1% - 3% slopes
- Eunola fine sandy loam, 1% - 3% slopes, rarely flooded
- Luverne loamy sand, 2% - 5% slopes, eroded
- Luverne loamy sand, 5% - 12% slopes, eroded
- Lynchburg loam, 0% - 2% slopes

Riverview-Bruno Complex, 1%-5% slopes
Springhill loamy sand, 1% - 5% slopes
Uchee loamy sand, 1% - 5% slopes
Uchee loamy sand, 5% - 12% slopes, eroded

Thirteen primary soil series are identified within the map units listed above. Inclusions of similar and dissimilar soils can be found within each map unit identified above. A total of approximately 13 acres of wetlands (hydric soils) are identified for all the action alternatives. Wetland soils are Bethera clay loam and Bibb-Chastain complex. Stand layout and delineation of riparian areas prior to implementing management prescriptions will eliminate management activities from occurring within any wetland soils. A soil map and descriptions of soil map units can be found in the project file.

Floodplain soils that are rarely flooded are the Bigbee, Bruno, Eunola and Riverview soil series. Bigbee soils are located on low stream terraces with slopes that are smooth and convex. Surface soil texture is loamy sand about 13 inches thick with loamy sand subsurface approximately 34 inches thick underlain by a subsoil of sand. Eunola soils are also found on low stream terraces. Slopes are generally long and smooth. Surface soil texture is fine sandy loam approximately 17 inches thick over subsoil having sandy clay loam textures approximately 53 inches thick. The substratum is loamy sand. The Riverview-Bruno complex consists of soils that are found on narrow small drainages. Slopes are gently undulating. Riverview soils have a loam surface layer about 3 inches thick. The subsoil to a depth of 34 inches is loam in the upper part and sandy clay loam in the lower part. The substratum sandy loam and loamy fine sand to a depth of 60+ inches. Bruno soils have a fine sandy loam surface to a depth of 11 inches. The substratum, to a depth of 60+ inches, is fine sand in the upper part and sand in the lower part

Lynchburg soils are located on old stream terraces that are not associated with recent floodplains. Slopes are generally smooth, long, and slightly concave. The surface layer has a loam soil texture approximately 6 inches deep. The subsurface layer is a sandy loam soil texture 10 inches thick. The underlying subsoil consists of three layers; the first layer is sandy loam, the second layer is sandy clay loam and the third layer sandy clay. All three layers are approximately 46 inches thick. The substratum is a mixture of sandy clay loam and sandy clay.

Soils located on ridge tops and side slopes are Cowarts, Dothan, Luverne, Springhill, and Uchee soil series. Cowarts soils are located on slopes ranging from 1% to 25% broken out into 3 separate map units. Cowarts soils have a loamy sand surface approximately 7 inches thick (there are areas within the 3 map units where the surface layer is entirely missing). The underlying subsoil is a sandy clay loam to clay loam approximately 27 inches thick. The remaining stratum is clay loam to a depth of 60+ inches. Dothan soils are located on slopes 1% - 3%. The surface layer is approximately 7 inches thick consisting of a sandy loam texture. The subsoil is approximately 54 inches thick with a sandy clay loam texture. Luverne soils are located on slopes ranging from 2% to 12% broken out into 2 separate map units. Luverne soils have a loamy sand surface layer approximately 9 inches thick (there are areas within the 2 map units where the surface layer is entirely missing) with a subsoil layer 37 inches thick with a clay loam to sandy clay loam texture. The substratum to a depth of 60+ is clay. Springhill soils are located on slopes of 1% to 5%. Springhill soils have a loamy sand surface layer approximately 5 inches

thick. The subsurface layer is approximately 14 inches thick with a mixture of loamy sand and sandy loam soil textures. The subsoil is sandy clay loam in the upper part and sandy loam in the lower part approximately 53 inches thick. The substratum is sandy loam with pockets of sandy clay loam. Uchee soils are located on slopes ranging from 1% to 12%. The surface layer is loamy sand approximately 9 inches thick. The subsurface layer is loamy sand approximately 12 inches thick. The subsoil is sandy clay loam approximately 31 inches thick. The substratum is sandy loam at a depth of approximately 60+ inches.

Macon County in the past has undergone moderate to severe erosion. Rills and gullies formed. Considerable amounts, and in places, the entire surface soil layer has been lost to sheet erosion. This phenomenon is well documented and briefly discussed earlier in this document. However, this is not necessarily the case for all the acreage composing the make up of the Tuskegee National Forest. Approximately 2,886 acres or 26% are soils classified as floodplain and terrace soils. These areas are accumulation points or building sites for soil as they collect soil during floods. Approximately 2,770 acres or 24% are soils classified as non-eroded uplands. These soils have a good surface layer, often referred to as topsoil. This leaves 5,616 approximate acres or 50% remaining. These soils are classified as being in an eroded phase. The soil map units on the Tuskegee National Forest affected by past erosion are the Cowarts sandy loam on 5% to 12% slopes, Cowarts-Uchee complex on 12% to 25% slopes (the Cowarts portion of the complex is considered eroded), Luverne loamy sand on 2% to 5% and Luverne loamy sand on 5% to 12% slopes. Past evidence of construction of erosion controlling terraces can be found on most of eroded soil map units. In addition, healed small gullies and rills can be found.

Environmental Effects

Disturbance of soils from management practices involving timber harvest, site preparation and reforestation will result in some form of physical, chemical and biological change. Direct effects to the soil resources are changes/loss of soil organic matter content, soil erosion, soil compaction, and nutrient leaching and/or displacement. Indirect effects are accelerated weathering, loss of soil as sediment, alteration of organic matter formation, and alteration of soil permeability/water infiltration.

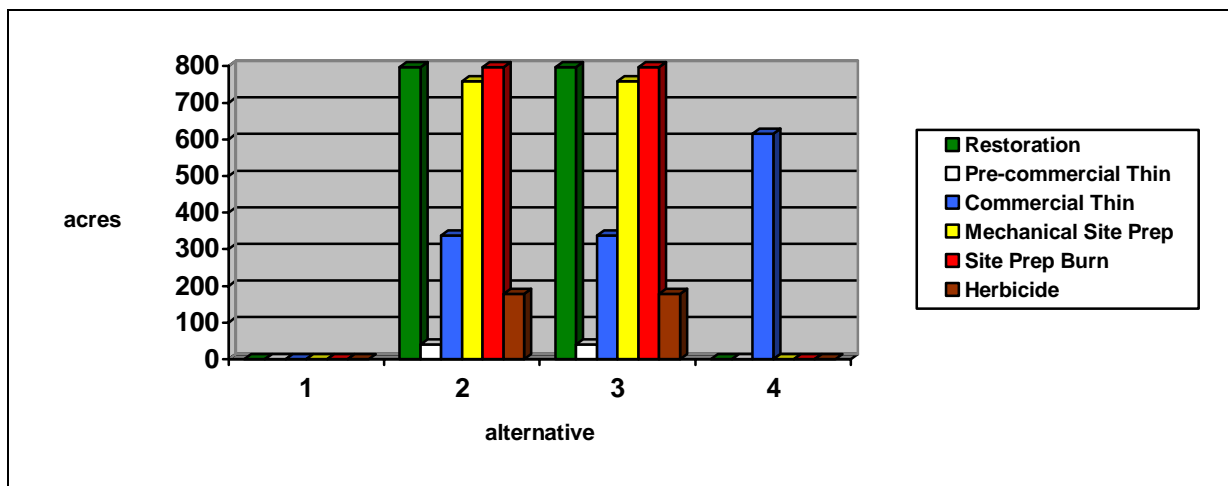
Silvicultural practices (restoration and thinning) are known to potentially affect the soil resource primarily through nutrient removal. Tree harvest proposed by all action Alternatives involves treatment by thinning or restoration involving over story removal leaving residual Longleaf pine. Proposed thinning and restoration activities will harvest the stem only with tree boles and needles remaining scattered on site. Nutrient removal from thinning or restoration, where harvesting the stem only, reduces nutrient removal by 50-60% (Pritchett and Fisher, 1987). Nutrients loss from stem removal is believed replaced by soil weathering and natural inputs (Grier et al., 1989, Jorgensen et al, 1971, Wells, 1971 and Pritchett and Fisher, 1987).

Comparison of alternatives reveals Alternative 1, the no action alternative, as having the least impact since no harvest treatments are proposed. Alternatives 2 and 3 propose the same acreage scheduled for thinning and restoration. Alternative 4 schedules 557.9 less acres for treatment. No pre-commercial thins or restoration treatments are proposed. In addition, no restoration associated site preparation is scheduled. Nutrient removal can be expected, based on acres to be

thinned and restored, to be equal for Alternatives 2 and 3. Alternative 4 can expect less nutrient removal compared to Alternatives 2 and 3 (refer to **Figure 3.A.1-1** “Vegetation Treatment and Site Preparation Treatments by Alternative”).

Temporary Roads constructed for access to proposed treatment stands and associated skid trails for thinning and restoration treatments are known to affect the soil resource primarily through nutrient removal, soil compaction and soil erosion. Nutrient loss is greatest on temporary roads since the surface organic layer and surface soil is removed in the process of construction. Skid trails under a thinning operation usually does not remove organic or soil surface layers leaving nutrients in place. Restoration operations will involve more traffic. Primary skid trails can be expected to remove organic layers

Figure 3.A.1-1: Vegetation and Site Preparation Treatments by Alternative



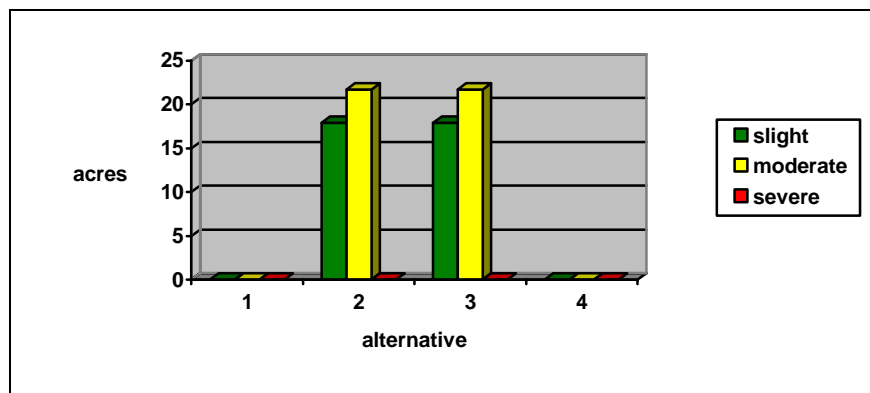
	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Restoration	0	796.5	796.5	0
Pre-commercial Thin	0	39.5	39.5	0
Commercial Thin	0	337	337	450
Mechanical Site Prep	0	758	758	0
Site Prep Burn	0	796.5	796.5	0
Herbicide	0	178	0	0

and expose soils as high as 50 percent. Secondary skid trails can be expected to have loss of organic surface and soil exposure as high as 25 percent. Soil compaction is dependant on soil texture, organic mater, and soil moisture (McKee et al. 1985). Soil compaction effects bulk density. The lower the bulk density range, the greater the impacts to tree growth from soil compaction. Lighter textured soils (sand) have a higher range in bulk density compared to heavier textured soils (clay). Presence of surface organic matter and tree limbs and leaves can buffer soil compaction by providing support to equipment. Soil moisture content has a pronounced effect on soil compaction as it influences soil porosity. Identifying soils by surface texture, maintaining surface organic matter, and operating equipment under low soil moisture conditions will reduce the effects of soil compaction within the general forest and on skid trails used for thinning and restoration operations. Temporary roads will be compacted the greatest

from multiple traffic use. Harvest technique can also reduce or increase the potential for soil compaction. Use of standard logging equipment (skidders) can compact the soil with as few as three passes over the same ground. Specialized equipment that reduces or disperses equipment weight, such as low-pressure tires, can assist with limiting soil compaction effects.

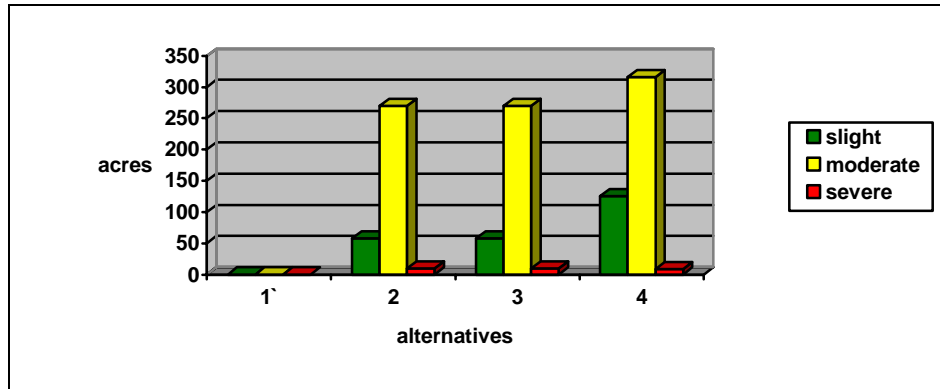
Alternative 1 proposes no treatments therefore soil compaction will not result from silvicultural activities. Comparison of alternatives 2, 3 and 4 (refer to **Figure 3.A.1-2** “Potential Soil Compaction – Pre-commercial Thin”, **Figure 3.A.1-3** “Potential Soil Compaction –Commercial Thin” and **Figure 3.A.1-4** Potential Soil Compaction – Restoration”) shows equal potential for soil compaction for thinning and restoration treatments under Alternatives 2 and 3. Alternative 4 has less potential for soil compaction compared to Alternatives 2 and 3. The majority of the soils have a moderate compaction rating. Unless using special equipment, operating under seasonally dry soil conditions, usually April thru November, will aide in reducing soil compaction from conventional harvesting equipment within stands. Harvest operations on soils rated as severe need to be conducted under dry conditions that usually occur late summer and early fall. Soil compaction can be expected on temporary roads. Both alternatives 2 and 3 have an equal amount of temporary road mileage proposal, an estimated 6 miles or approximately 8.8 acres. Alternative 4 proposes 1.85 miles or 2.7 acres of temporary roads. Application of mitigating measures will assist in reducing the effects of soil compaction over a three to five year period. Full recovery can take as long as 20 years.

Figure 3.A.1-2: Potential Soil Compaction - Pre-commercial Thin



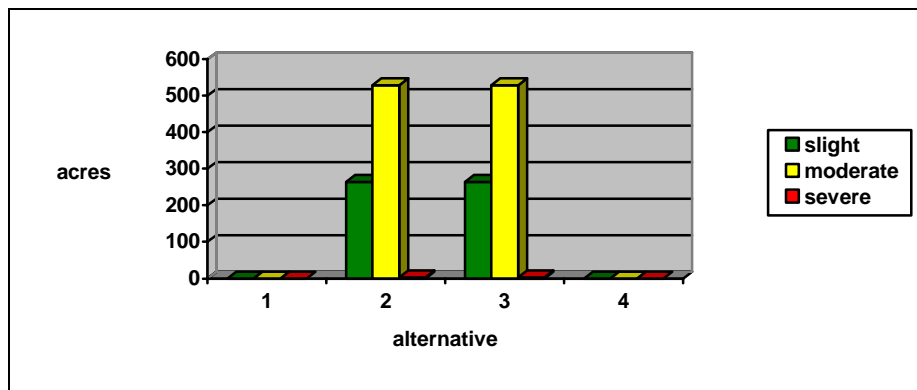
	Alternative 1	Alternative 2	Alternative 3	Alternative 4
slight	0	17.9	17.9	0
moderate	0	21.7	21.7	0
severe	0	0	0	0

Figure 3.A.1-3: Potential Soil Compaction - Commercial Thin



	Alternative 1	Alternative 2	Alternative 3	Alternative 4
slight	0	58.1	58.1	199.9
moderate	0	269.4	269.4	404.3
severe	0	9.5	9.5	10.9

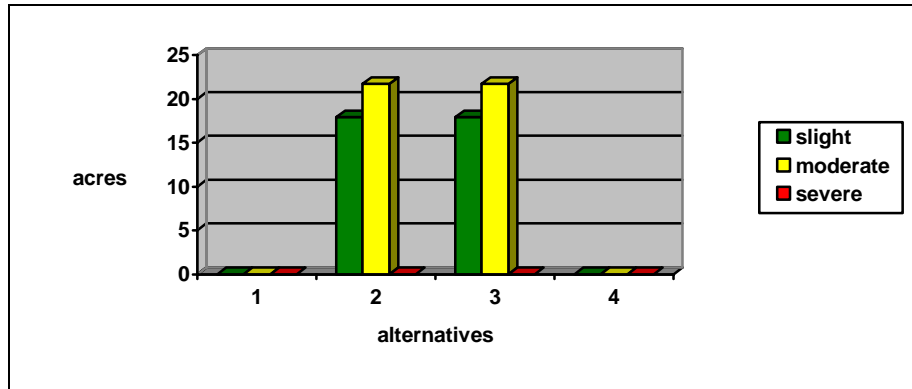
Figure 3.A.1-4: Potential Soil Compaction - Restoration



	Alternative 1	Alternative 2	Alternative 3	Alternative 4
slight	0	264.4	264.4	0
moderate	0	528.6	528.6	0
severe	0	3.5	3.5	0

Soils susceptible to erosion are those soils exposed to the elements of nature, primarily water from rainfall and landform position where increases in slope steepness increases the erosion hazard. Research observations and many studies (Hewlett, Lull, Reinhart, et al.) on experimental watersheds have shown that soil erosion is a product more by fire and/or mechanical disturbance than the actual harvest of trees. Monitoring of stands that had been clear cut (1988, 1993, and 1994) has found soil exposure to occur primarily on temporary roads and skid trails with minor soil exposure off roads and skid trails. Soil erosion from thinning and restoration operations

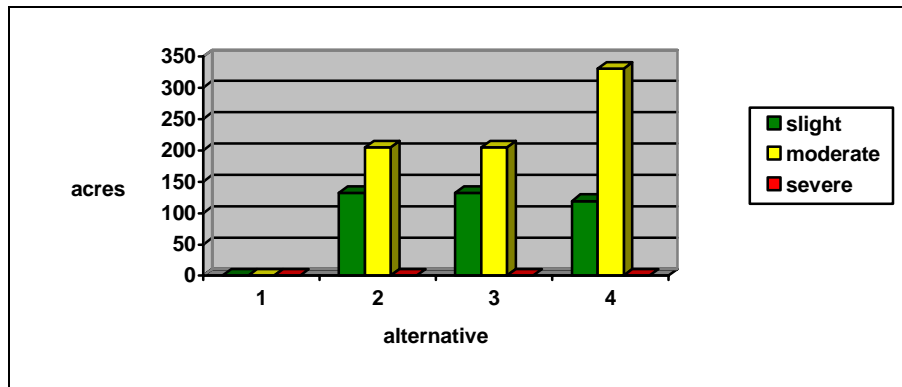
Figure 3.A.1-5: Potential Soil Erosion - Pre-commercial Thin



	Alternative 1	Alternative 2	Alternative 3	Alternative 4
slight	0	17.9	17.9	0
moderate	0	21.7	21.7	0
severe	0	0	0	0

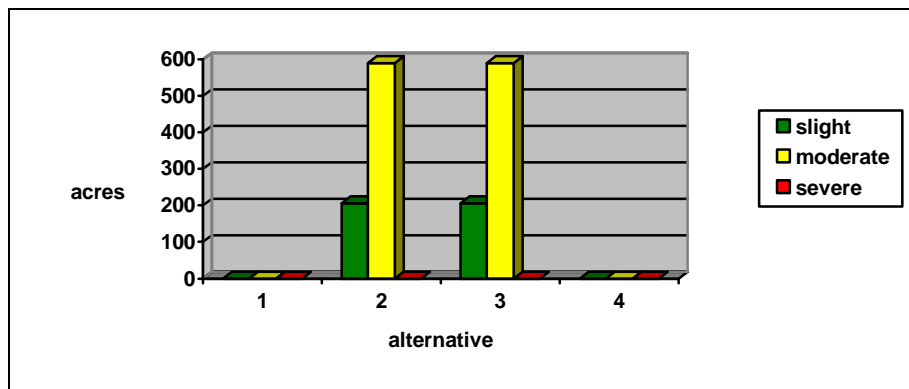
were found to be low, occurring on less than 3 percent of the acreage for thinning and 10 percent of the acreage from restoration. Alternatives 2 and 3 have equal potential for soil erosion. Both alternatives 2 and 3 are overall greater than alternative 4. (Refer to **Figure 3.A.1-5** “Potential Soil Erosion – Pre-commercial Thin”, **Figure 3.A.1-6** “Potential Soil Erosion – Commercial Thin” and **Figure 3.A.1-7** “Potential Soil Erosion – Restoration”).

Figure 3.A.1-6: Potential Soil Erosion - Commercial Thin



	Alternative 1	Alternative 2	Alternative 3	Alternative 4
slight	0	132.2	132.2	119.4
moderate	0	204.7	204.7	330.2
severe	0	0	0	0

Figure 3.A.1-7: Potential Soil Erosion - Restoration



	Alternative 1	Alternative 2	Alternative 3	Alternative 4
slight	0	206.7	206.7	0
moderate	0	589.8	589.8	0
severe	0	0	0	0

The primary source of soil erosion is temporary roads for the duration they are in use. Alternatives 2 and 3 have equal miles of temporary roads proposed, an estimated 6 miles or approximately 8.8 acres. Alternative 4 proposes 1.85 miles or 2.7 acres of temporary roads. Application of mitigating measures will assist in reducing the effects of soil erosion over a two to three year period.

Herbicide Site Preparation has no known direct or indirect effects on the soil physical and chemical properties. Herbicides may affect soil productivity through biotic impacts, soil erosion, and nutrient leaching (Veg. Mgmt. FEIS volume 1, pIV-90). Resulting changes in soil organisms are due more from physical than chemical effects (Mayack and others 1982). Where adverse effects have been observed, herbicide concentrations exceeded those measured under actual operational conditions (Fletcher and Friedman 1986). However, a general consensus is herbicide usage at normal forestry rates does not reduce the activity of soil micro-organisms. There is no evidence to date that herbicides currently in forest management in the South produce any adverse effects on site productivity. Herbicides do not disturb the surface soil. Soil erosion is limited to pre-existing exposed soils that may lose vegetative cover from herbicide use or from mechanical method of application. Alternative 2 uses a foliar and or stem application methods. Neary and others (1986) found erosion rates to be less than burning or mechanical forms of site preparation and depending on the quantity of pre-existing bare soil sites; soil erosion was slightly above no treatment (control) plots. Nutrient leaching after herbicide use has been little studied. Based on nitrate losses found by Neary, Bush, and Douglas (1983), nitrogen losses are less than 10 lbs/acre due to suppression of vegetative uptake. Loses of other less mobile nutrients are negligible.

Triclopyr (Garlon 4 or equivalent product) is not highly mobile in the soil and is absorbed primarily by plant leaves moving readily throughout the plant. Triclopyr is rapidly broken down by soil organisms and ultraviolet light, persists an average of 30-56 days depending on soils and weather. Triclopyr is not strongly absorbed by soil. Glyphosate is similar to Triclopyr in that it

is a foliar active herbicide with a half-life of 30-60 days depending on soils and weather. Glyphosphate rapidly breaks down from soil microbes but is strongly absorbed by soils and ultraviolet light has no affect. Imazapyr (Arsenal or equivalent product) is also not very mobile in soil but is soil active as well as foliar active. Imazapyr has a half-life of 19-34 days. Studies in Alabama (Michael 1986) determined Imazapyr half-life in treated vegetation under field conditions ranged from 12 to 35 days and in soil from 19 to 34 days.

Comparison of herbicide use by Alternative reveals Alternative 2 proposing the greatest acreage for herbicide application. Alternatives 3 and 4 propose no use of herbicides (refer to **Figure 3.A.1-1**: “Vegetation and Site Preparation Treatments by Alternative”).

Prescribe burn and site preparation burning has the potential to consume organic matter, change the surface physical properties of the soil, and kill soil biota through soil heating. Loss of organic matter results in loss of nutrients and increases the susceptibility of soil to erosion. Soil heating can affect soil biota and surface soil structure indirectly affecting the soils capacity to absorb water. The potential for negative effects increases with the severity of the burn. Burns that do not consume the entire surface organic layer provide the least potential for effects versus burns that consume the entire surface organic layer and are hot enough to crystallize the soil surface. Research has found that prescribed burning for 20 years in a mature southern pine stand resulted in a small increase in soil pH, organic matter, nitrogen, phosphorus, calcium, and magnesium in the surface 2-4 inches of mineral soil (Wells et al., 1971). Light burns have positive nitrogen budgets, moderate burns have neutral nitrogen budgets and severe burns have negative nitrogen budgets. Less mobile nutrient losses are negligible (VM EIS IV-93). Stone (1971) has summarized the findings of others and reports that organic matter and nitrogen contents are not reduced by light annual burns; supplies of bases and mineral nutrients are little affected, porosity and infiltration of water are not affected and hydrological effects of burning appear minor on coastal plain soils. Prescribe burning for site preparation, (following burning plans); usually result in slight to moderate intensity burns. These types of burns have the potential to result in slight to moderate exposure, which is usually dispersed rather than concentrated. Monitoring of site preparation burns on coastal plain soils, following herbicide treatment, on the Oakmulgee Division, Talladega National Forest (1993) revealed that 80-85 percent or more of the ground cover remained intact after a moderate site preparation burn and that exposed soils were dispersed. Natural re-vegetation occurred within two to three years on exposed soils. Soil erosion is expected to be minimal from the actual burn. Research has found that drastic changes in soil physical properties and removal of forest floor materials sufficient to cause significant increases in erosion rates can be expected from severe fires or on sites where the combination of slope, soil and rainfall pose high risk. Severe burns can result in serious erosion resulting from large areas of exposed soils. Soil texture and surface properties are not affected by slight to moderate burns. Slight to moderate burns usually do not affect organic matter but surface litter and duff can be partially or totally consumed. Severe burns can consume organic matter and alter the soil physical properties. Alteration of soil physical properties can result in loss of soil porosity, water holding capacity, and infiltration. Soil biota can be destroyed. Robichaud (1994) compared low intensity and high intensity site preparation burns in relation to surface runoff and sediment yields. Low intensity burns on an average 30 percent slope where litter moisture was above 50 percent found surface runoff and sediment yield to be very low as a result of sufficient surface litter remaining after the burn thus protecting the soil

surface from erosion. The high intensity burns on an average 30 percent slope with very low litter moisture (less than 6 percent) found 96 percent litter lost and 76 percent of the humus layer was lost resulting in soil exposure greater than 75 percent. The result was a 5 fold increase in surface runoff and a 4 fold increase in sediment yield. A high risk from soil erosion occurs on constructed fire lines where soil exposure is usually necessary to maintain control of the fire.

Comparison of burns by alternative (refer to **Figure 3.A.1-1** – “Vegetation and Site Preparation Treatments by Alternative”) reveals Alternative 2, 3 and 4 to have equal acreage proposed for site preparation burning. Although prescribed burn is not a proposed action, over the life of this EA a total of 3,700 acres per year are scheduled for prescribe burn treatment. Implementation of standards for erosion control on fire lines will mitigate soil erosion. Following standards and prescribe burn plans will avoid severe burns.

Mechanical site preparation use of a rolling drum chopper is the only mechanical form of site preparation proposed. Use of a rolling drum chopper is known to affect the soil resource primarily through soil compaction and soil erosion. Soil compaction is minimal if soil moisture is low and there is presence of surface debris and/or organic matter. The action of the chopper blade creating shallow indentations also assists in reducing soil compaction by breaking up the top few inches of soil. The chopper indentations also assist with water infiltration reducing soil erosion potential from rainfall runoff. Soil erosion is also expected to be minimal due to small, scattered areas of exposed soils, usually a result from the equipment (dozer) when making turns.

Additional discussion of direct, indirect and cumulative effects from herbicides, prescribed burns and mechanical methods to soil productivity are presented in the Vegetative Management-Final Environmental Impact Statement (VM-FEIS).

Comparison of the use of mechanical site preparation in the form of a rolling drum chopper by alternative (refer to **Figure 3.A.1-1** – “Vegetation and Site Preparation Treatments by Alternative”) reveals Alternative 2 and 3 to have equal acreage proposed for mechanical site preparation. Alternative 4 does not propose any mechanical treatments.

Reforestation by hand planting is proposed. Hand planting of trees has no potential for direct/indirect impacts to the soil resource.

Alternative 1 (No Action)

Effects to the soil resource are a result of ground disturbing activities. This alternative proposes no new ground disturbing activities. The current prescribe burn program will continue at a rate of 3,700 acres per year from 2004 thru 2012. The current influences of the Southern Pine Beetle can be expected to continue to some degree.

Alternative 2

This alternative proposes pre-commercial thinning on 39.5 acres; thinning on 337 acres; 796.5 acres of restoration and 6 miles of temporary roads providing access. Site preparation associated with restoration is as follows: herbicide treatment on 178 acres, roller drum chop on 758 acres

and site preparation burn on 796.5 acres. Planting trees will occur on 796.5 acres. The current prescribed burn program will continue at a rate of approximately 3,700 acres per year between the years 2004 and 2012. The potential for soil erosion is of concern on temporary roads, site preparation burns on slopes exceeding 20 percent, and fire lines. The potential for soil compaction is of concern on soils rated as moderate during wet soil conditions and soil rated as severe during moist to wet soil conditions. Application and maintenance of mitigating standards should result in minimizing impacts from soil compaction and reducing the potential for soil erosion to occur. Application and maintenance of soil standards are expected to maintain soil productivity.

Alternative 3 (No Herbicide)

This alternative proposes pre-commercial thinning on 39.5 acres; thinning on 337 acres; 796.5 acres of restoration and 6 miles of temporary roads providing access. Site preparation associated with restoration is as follows: roller drum chop on 758 acres and site preparation burn on 796.5 acres. Planting trees will occur on 796.5 acres. The current prescribed burn program will continue at a rate of approximately 3,700 acres per year between the years 2004 and 2012. The potential for soil erosion is of concern on temporary roads, site preparation burns on slopes exceeding 20 percent, and fire lines. The potential for soil compaction is of concern on soils rated as moderate during wet soil conditions and soil rated as severe during moist to wet soil conditions. Application and maintenance of mitigating standards should result in minimizing impacts from soil compaction and reducing the potential for soil erosion to occur. Application and maintenance of soil standards are expected to maintain soil productivity.

Alternative 4

This alternative proposes commercial thinning on 450 acres and 1.85 miles of temporary road construction. No site preparation is associated with this alternative. The current prescribed burn program will continue at a rate of approximately 3,700 acres per year between the years 2004 and 2012. The potential for soil erosion is of concern on temporary roads and fire lines. The potential for soil compaction is of concern on soils rated as moderate during wet soil conditions and soil rated as severe during moist to wet soil conditions. Application and maintenance of mitigating standards should result in minimizing impacts from soil compaction and reducing the potential for soil erosion to occur. Application and maintenance of soil standards are expected to maintain soil productivity.

Mitigation Measures

Burning of material generated by timber activities or mechanical fuel treatments (slash) is done so it does not consume all litter and duff and does not alter the structure and color of mineral soil on more than 20 percent of the area.

Soils with a moderate to severe soil compaction ratings will operate mechanical site preparation treatments when soils are dry. Soils are considered dry when rutting and/or equipment slippage is minimal. Refer to Section 3.A.2. (Mitigation measures under the water section) for additional mitigation measures that provide protection to both soil and water resources.

Cumulative Effects (Soil)

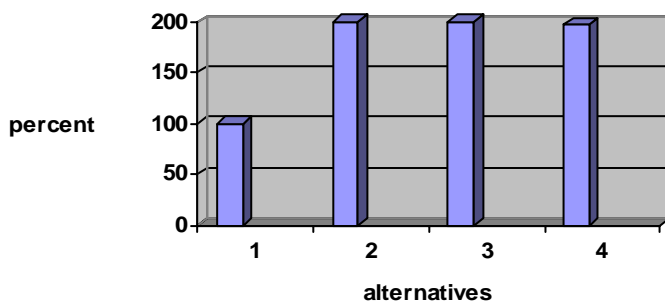
Cumulative effects are changes in soil productivity. Research concludes that most soils could replace the nutrients in a harvested area without a long-term decrease in soil productivity (Grier et al., Jorgensen and Wells, Pritchett and Fisher). Comparison for soil compaction hazard rating results in no difference for pre-commercial thinning, thinning and restoration between action alternatives 2 and 3. Cumulative effects of soil compaction from pre-commercial thinning operations are not expected on 45 percent of the acreage (slight hazard rating) for Alternatives 2 and 3. Cumulative effects of soil compaction from commercial thinning operations are not expected on 17 percent of the acreage (slight hazard rating) for Alternatives 2 and 3. Alternative 4 cumulative effects from soil compaction after thinning operations is not expected on 33 percent of the acreage (slight hazard rating). Cumulative effects of soil compaction from restoration operations are not expected on 33 percent of the acreage (slight hazard rating) for Alternatives 2 and 3. Approximately 56% of the acreage (moderate hazard rating) under pre-commercial thinning and 80% of the acreage (moderate hazard rating) for commercial thinning, under Alternatives 2 and 3, can expect some soil compaction primarily on primary skid trails and associated temporary roads. Alternative 4 can expect some soil compaction on 65 percent of the acreage. Approximately 66% of the acreage (moderate hazard rating) under restoration can expect some soil compaction primarily on skid trails, loading decks, and associated temporary roads. Approximately 9.5 acres or 3% of the acreage scheduled for commercial thinning has a severe soil compaction rating under Alternatives 2 and 3. Alternative 4 has a severe soil compaction rating on approximately 2 percent of the acreage. In addition, restoration is scheduled for 3.5 acres or 1% under Alternatives 2 and 3, where the soil compaction rating is severe. As previously discussed (under section 3.1.2 Affected Environment) these acres are located within wetlands. During stand sale layout, these acres will be eliminated from having any vegetation removal. On average, 10 percent or less acreage consists of skid trails, loading decks and temporary roads. They are usually used again upon re-entry to the stand for future management needs. Alternatives 2 and 3 have equal potential for soil compaction as a result of both alternatives proposing the same treatment acres. Alternative 4 has less potential for soil compaction compared to Alternatives 2 and 3 due to less total acres involved and thinning is the only management applied. Application of mitigating measures to skid trails, loading decks, and temporary roads involving scarifying the ground, fertilizing, and planting grasses will aid in reducing the effects from soil compaction over a 2 to 3 year period as vegetation is established. Effects from soil compaction, particularly on temporary roads, are not expected to fully recover due to the expectation of being used again with future entry for vegetative management.

Comparison for soil erosion hazard rating results in very little difference for both pre commercial and commercial thinning and restoration between the Alternatives 2 and 3. Cumulative effects from soil erosion are not expected on approximately 45% (slight hazard rating) of the acreage to be pre-commercial thinned, approximately 39% of the acreage to be commercially thinned and approximately 26% of the acreage to be restored. Alternative 4 finds cumulative effects from soil erosion to not be expected on 27 percent (slight hazard rating) of the acreage. Approximately 56 percent of the acreage (moderate hazard rating) under pre-commercial thinning and approximately 61 percent of the acreage (moderate hazard rating) for commercial thinning, and approximately 74 percent of the acreage to be restored can expect some soil erosion primarily on temporary roads, skid trails, site preparation burn sites and fire lines for

Alternatives 2 and 3. Alternative 4 finds 73 percent (moderate erosion hazard) of the acreage having moderate soil erosion potential. Soil erosion primarily on temporary roads, skid trails, site preparation burn sites and fire lines can be expected. There are no acres identified containing soils that are rated a severe for soil erosion under Alternatives 2, 3 and 4. Alternatives 2 and 3 have equal potential for soil erosion as a result of both alternatives proposing the same treatment acres. Alternative 4 has a less potential for soil erosion compared to Alternatives 2 and 3 resulting from less acres of overall treatment and applying thinning as the only management treatment. Application of mitigating measures will be needed to assist with reducing soil erosion. Soil erosion is expected to last from 2 to 3 years.

Erosion values were determined using a sediment model developed by Alan Clingenpeel and is discussed under section 3.2.5 Cumulative Effects (Water). Results of the model, displaying soil erosion increases in percent above baseline (baseline equaling 100%) for all alternatives, are displayed below (refer to **Figure 3.A.1-8: Average Soil Erosion Potential Increase over Baseline by Alternative**). Alternative 1 does not propose any actions.

Figure 3.A.1-8: Average Soil Erosion Potential over Baseline by Alternative



Cumulative effects to the soil resource from implementation of one of the action alternatives peaks in 2004 and is expected to continue thru 2012. Cumulative effects are no different between Alternatives 2 and 3 since the treatment acreage for disturbance are equal. The use or non-use of chemicals has little to no effect on soil compaction or soil erosion. Cumulative effects for Alternative 4 is slightly less (less than 2%) compared to Alternatives 2 and 3. Less acres being treated and applying thinning only accounts for the decrease in cumulative effects.

No long-term loss of soil productivity is expected. No permanent roads or other permanent facilities are planned under any action alternative. Short-term soil loss is expected on temporary roads, areas of site preparation burn, and fire lines.

Monitoring

The proposed project area will be monitored for compliance with Forest standards (Best Management Practices) in accordance with the current Forest Land Management Plan. During vegetation operations, roads and skid trails account for more than 95 percent of the effects to soil productivity followed by site preparation which accounts for approximately 3 percent of the

effects on soil productivity. An implementation and effectiveness monitoring plan of Forest standards (BMPs) for roads, skid trails, and site preparation methods will be developed and implemented.

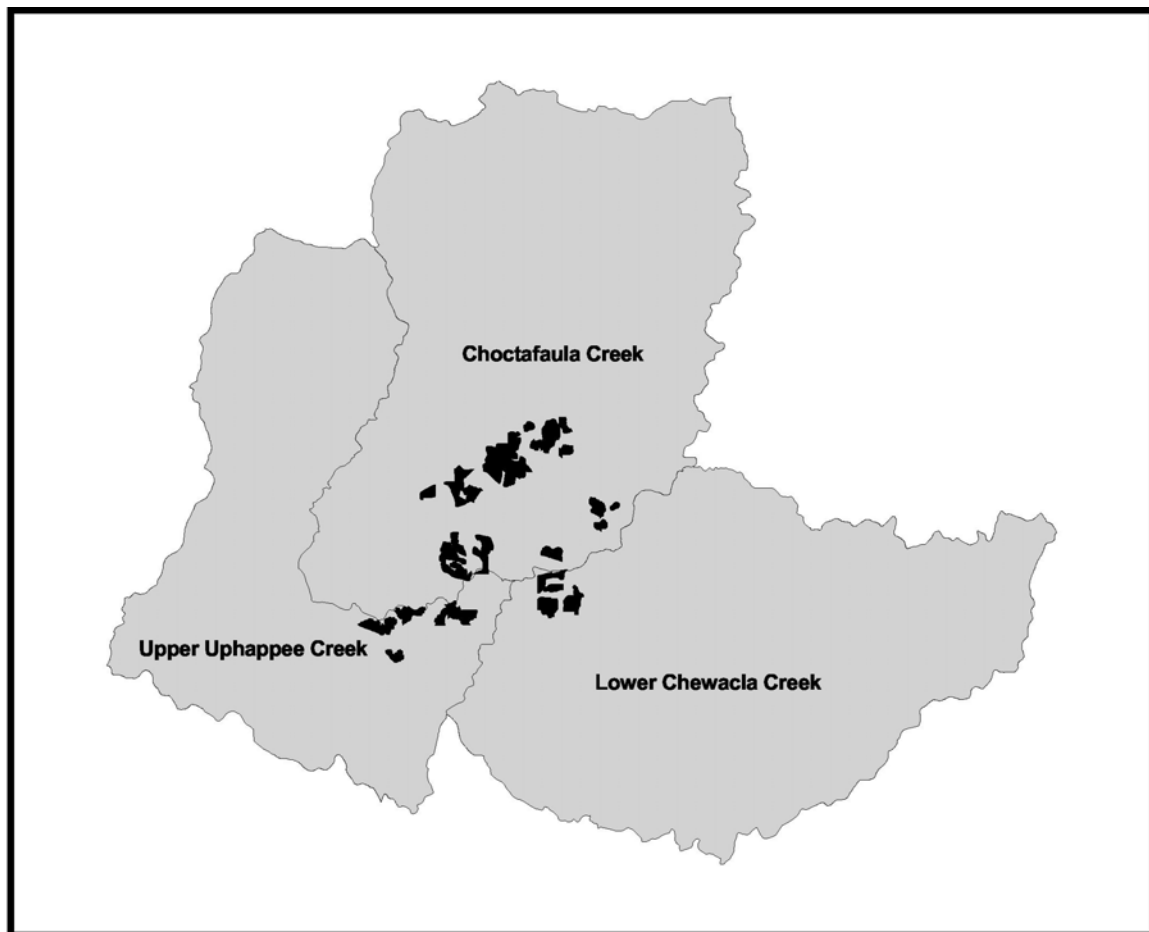
3.A.2 Water Resources

Issues:

The major issue related to water quality raised during scoping with USDA Forest Service employees and the public, were concerns of the effects of sedimentation and the use of herbicides on water quality from proposed activities within these watersheds.

Affected Environment:

The proposed management activities on the Tuskegee National Forest fall within three 6th level watersheds, the Choctafaula Creek, the Upper Uphapee Creek, and the Lower Chewacla Creek. The Choctafaula Creek and the Upper Uphapee Creek watersheds are within the Uphapee Creek 5th level watershed and the Lower Chewacla Creek is within the Chewacla Creek 5th level watershed. Both of these 5th level watersheds are within the Lower Coosa watershed of the Tallapoosa Basin.



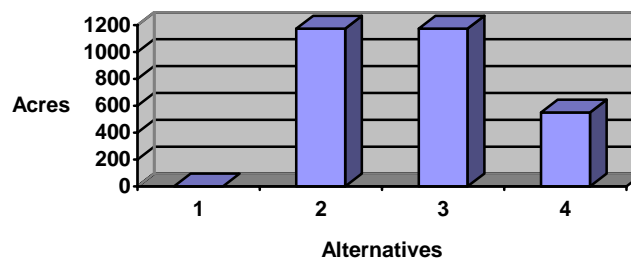
Based on the findings of the analysis for the Final Environmental Impact Statement for the Revised Land and Resource management plan the Uphapee Creek and the Chewacla 5th level watersheds were found to have a moderate potential to adversely affect beneficial uses. Alabama Department of Environmental Management (ADEM) has only one stream designated for beneficial uses within the project area. The Uphapee Creek is designated for Fish and Wildlife uses. There are no streams listed as impaired by ADEM within the project area.

Environmental Effects:

Silvicultural practices (restoration, thinning and pre-commercial thinning) are known to potentially affect water quality, water quantity, channel morphology, and down stream designated beneficial uses. Restoration, thinning and pre-commercial thinning cuts have the potential to cause the following direct effects: erosion, changes in ground cover condition and changes in stand composition of streamside forest communities (Golden et al., 1984; Ursic, 1991; Belt et al., 1992; Brown and Binkley, 1994). Indirect effects could include sedimentation, changes in stream nutrient levels (particularly nitrates) increases in water yield, and changes in stream flow behavior (Golden et al., 1984; Brown and Binkley, 1994).

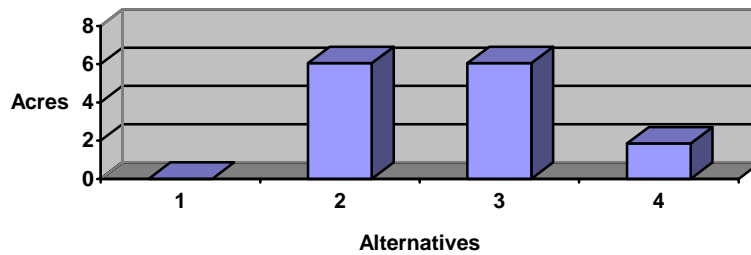
A comparison of Alternatives obviously reveals that the No Action Alternative (Alternative 1) has the least potential for impacts. Alternatives 2 and 3 show the same potential for impacts from restoration, thinning and precommercial thinning. (See chart below.) The Choctafaula Creek watershed has 817 acres of these proposed silvicultural activities, followed by the Upper Uphapee Creek watershed with 194 acres, and the Lower Chewacla Creek watershed with 162 acres in Alternatives 2 and 3. Alternative 4 proposes 450 acres of thinning with the majority being in the Choctafaula Creek watershed with 297 acres, followed by the Lower Chewacla Creek watershed with 87 acres, and the Upper Uphapee Creek watershed 66 acres.

Restoration, Thinning and Pre-commercial Thinning



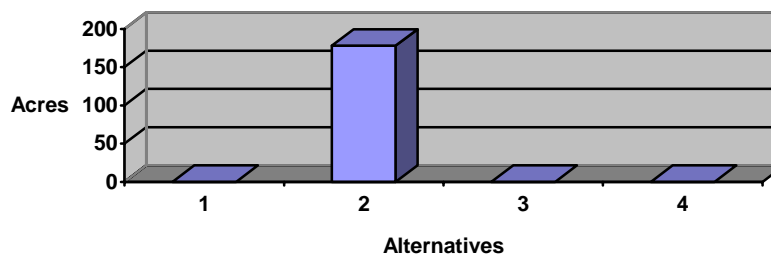
Temporary roads associated with thinning and restoration cuts are also known to potentially affect water quality, water quantity, channel morphology, and downstream designated beneficial uses. State Best Management Practices as well as Forest-Wide standards will be applied to these roads as mitigation measures. Here again the No Action Alternative will have the least impact because there will be no silvicultural activities therefore no roads. Alternatives 2 and 3 have the greatest potential for impact. (See chart below.) The Choctafaula Creek watershed has 3.85 miles proposed temporary roads, followed by the Upper Uphapee Creek watershed with 2 miles, and the Lower Chewacla Creek watershed with 0.2 miles.

Temporary Roads



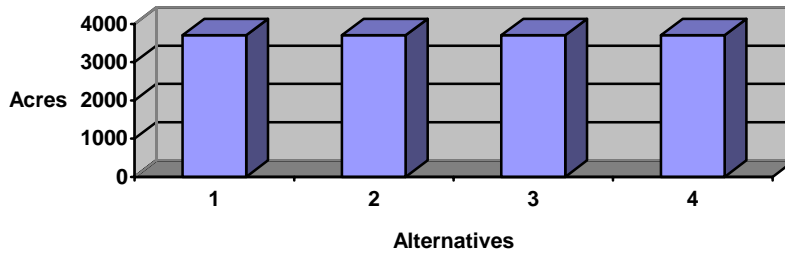
Water pollution by an *herbicide* can occur during storage, transport, application, clean up and/or container disposal. Direct effects of herbicide application are potential chemical contamination of surface and ground waters (Michael and Neary, 1993: VM EIS IV-103). Indirect effects are potential increases in sediment and water yield (VM EIS IV-103). Slight increases in stream nutrients, particularly nitrates (Neary et al., 1993), may also occur as an indirect effect. Alternative 1, the No Action Alternative and Alternative 3, the No Herbicide Alternative have no potential for impacts from herbicide use. Alternative 2 has the highest potential for impacts. (See chart below.) The Choctafaula Creek Watershed is the only watershed in which site prep using herbicides is proposed.

Herbicides

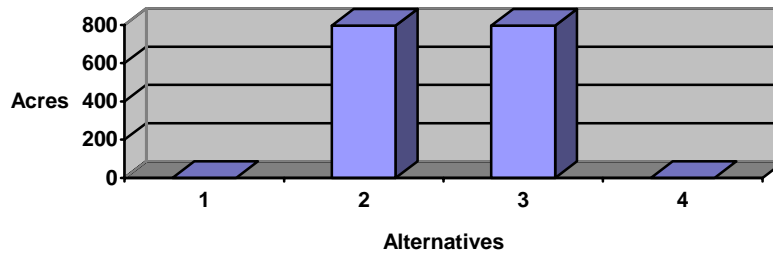


Site preparation and/or prescribed burns are used under all alternatives. Alternative 1 would continue the present level of prescribed burns but would have no site preparation burns. Alternative 2 and 3, site preparation and prescribed burns. Prescribed and release burns are generally of low intensity while site preparation burns are generally of high intensity. Direct effects from prescribed burning and under burns are potential changes in ground cover and increase in the hydrophobicity (water repellency) of a soil as well as erosion from plowed fire lines (VM EIS, Appendix B; Shahlaee et al., 1991). The severity of indirect effects depends on the intensity of the fire. Indirect effects are potential increase in sediment, storm flows and nutrient levels in the water column (VM EIS, IV-114). Site preparation burns show the greatest potential for impact under Alternatives 2 and 3. Prescribed burns are not a proposed action under this EIS but will continue under this planning period for all Alternatives at a rate of approximately 3,700 acres per year. Therefore the potential for impacts from prescribed burns stays static across all alternatives. (See charts below.) The Choctafaula Creek watershed has 499 acres of proposed site prep burns, followed by the Upper Uphapee Creek watershed with 175 acres, and the Lower Chewacla Creek watershed with 122.5 acres.

Prescribed Burns

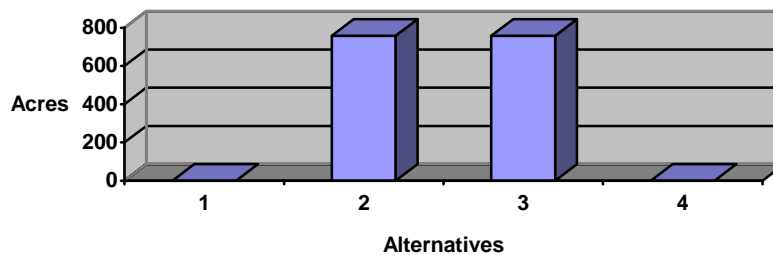


Site Prep Burns

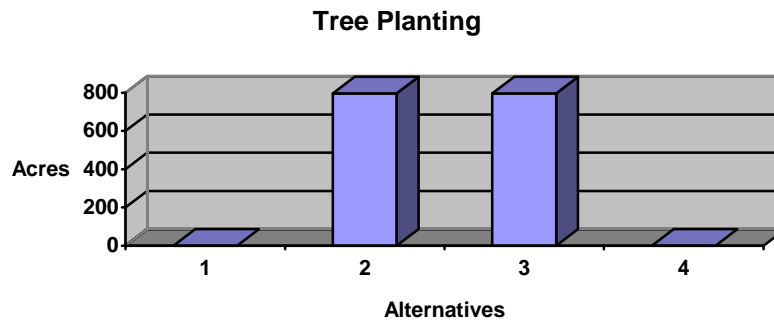


Drum chopping is the only heavy mechanical site preparation proposed. Direct effects from heavy mechanical site preparation (drum chopping, shear and windrowing) are potential changes in ground cover, increased exposure of soil, surface soil compaction from equipment and exposure of subsurface soil layers as a result of shearing operation (Blackburn et al., 1985). Indirect effects are potential increases in sediment, storm flows, nutrient levels in the water column and surface storage of runoff water (VM EIS IV-112). Drum chopping typically causes little to no adverse effects upon the water, shear and windrow may. Alternatives 2 and 3 have the highest potential for impact. (See chart below.)) The Choctafaula Creek watershed has acres of proposed drum chopping with 476, followed by the Upper Uphapee Creek watershed with 160 acres, and the Lower Chewacla Creek watershed with 122 acres.

Drum Chopping



Hand or mechanical planting of young trees has no direct effect upon the water resource. Indirect effects (after a period of years) are potential decreases in water yield and changes in the composition of streamside forest communities. Alternatives 2 and 3 show the highest potential for indirect effects. (See charts below.) The Choctafaula Creek watershed has 499 acres of proposed tree plantings, followed by the Upper Uphapee Creek watershed with 175 acres, and the Lower Chewacla Creek watershed with 122.5 acres.



Alternative 1 (No Action)

Alternative 1, the No Action Alternative has no new proposed actions. The current prescribed burns will continue at a rate of approximately 3,700 acres per year. The current influences of the Southern Pine Beetle can be expected to continue to some degree.

Alternative 2 (Proposed Action)

The proposed action calls for 337 acres of thinning, 39.5 acres of pre-commercial thinning 796.5 acres of restoration cutting and 6.05 miles of temporary roads associated with these thinning and restoration cuts. The current prescribed burns will continue at a rate of approximately 3,700 acres per year. Chemical site preparation will occur on 178 acres. Site preparation in the form of burning will occur on 796.5 acres. Mechanical Site Prep in the form of drum chopping will occur on 758 acres. Planting of trees will occur on 796.5 acres. The proposed activity of primary concern is the amount of temporary roads. These roads should have minimal impacts if mitigation measures are followed.

Alternative 3 (No Herbicide)

This alternative action calls for 337 acres of thinning, 39.5 acres of pre-commercial thinning 796.5 acres of restoration cutting and 6.05 miles of temporary roads associated with these thinning and restoration cuts. The current prescribed burns will continue at a rate of approximately 3,700 acres per year. Chemical site preparation will not occur. Site preparation in the form of burning will occur on 796.5 acres. Mechanical Site Prep in the form of drum chopping will occur on 758 acres. Planting of trees will occur on 796.5 acres. The proposed activity of primary concern is the amount of temporary roads. These roads should have minimal impacts if mitigation measures are followed.

This alternative action calls for 450 acres of thinnings 1.85 miles of temporary roads associated with these thinnings. The current prescribed burns will continue at a rate of approximately 3,700 acres per year. The proposed activity of primary concern is the amount of temporary roads. These roads should have minimal impacts if mitigation measures are followed.

Mitigation Measures

All areas requiring re-vegetation for erosion control will be treated during the spring and or fall grass planting seasons or within 6 months following the close out of the ground disturbing activity. The areas will be considered successfully treated when 85% or greater vegetation cover is established within 2 years of the initial treatment.

A 35 foot minimum no equipment zone will be maintained around gully heads and sidewalls. Timber may be selectively removed from within the 35 foot zone thru use of chainsaws and cable.

Resource activities that may affect water quality will implement State Best Management Practices as a minimum to meet water quality objectives. RFLMP standards that exceed State BMP's will take precedence.

All soil disturbing activities (excluding roads and trails) will not take place on water-saturated soils. Standing water and puddling are evidence of a saturated condition. (Soil disturbing activities are not limited to timber harvesting.)

Slash burns are done so they do not consume all litter and duff and alter structure and color of mineral soil on more than 20 percent of the area.

Water Control structures necessary for the control of surface water movement from disturbed sites will be constructed during or within two weeks following construction for temporary roads and within two weeks following the close out of the disturbing activity for skid trails.

Mineral soil exposure from ground disturbing activities (roads and trails excluded) will not exceed 10% on slopes exceeding 20% and 20% on slopes 20% or less.

Water control structures necessary for the control of surface water movement on fire lines will be installed during fire line construction. Permanent fire lines will have water control structures maintained (refer to re-vegetation standard).

Only herbicides with aquatic-labels may be used within 100 horizontal feet of any riparian area, streamside management zones and/or public water supply.

No areas will be treated during the time period 4 hours before expected rain to 4 hours after rain stops. The preferred months of treatment would be July, August and September.

All herbicide application will be done under supervision of a Certified Pesticide Applicator.

Herbicide application methods are limited to direct foliar spray, cut surface treatments and basal treatments.

Cumulative Effects (Water)

Cumulative watershed effects are caused by changes that accumulate in time and/or space. Unlike the impact of a single influence, which can be assessed, cumulative watershed effects are caused by the incremental results of multiple influences. In this analysis, cumulative watershed effects are represented by sediment. Sediment is an appropriate measure to determine the effects of management activities on water quality and its associated beneficial uses on forested lands (Coats and Miller, 1981). Sediment increases can adversely affect fish productivity and diversity (Alexander and Hansen, 1986), degrade drinking water and affect recreational values. There may be other cumulative impacts such as increases in water yield as a result of harvesting methods. However, water yield models do not characterize the impacts of all management activities such as road construction and the increase in water yield is generally less than the natural variability. Changes in water nutrients or nutrient fluxes within streams as a result of management activities are minor. The model used predicted sediment yields as the surrogate for determining cumulative impacts for water quality.

Bounding the Effects Analysis

A valid cumulative effects analysis must be bounded in space and time. For the purposes of this analysis, 6th level watersheds are the appropriate spatial bounds for cumulative effects. The time period for this analysis will be 2004 through 2012.

Modeling Sediment Yield

Using the National Land use Classification Data (NLCD), a determination of land uses were made for 30-meter grids. These values were tabulated for each watershed including non-Forest Service lands. Results were used to identify estimated erosion values for entire watersheds. The sediment model used was designed by Alan Clingenpeel. The erosion for roads was determined using the RAP roads layer to determine miles by surface type per watershed. ATV trails and erosion from prescribed burns were also used. Erosion from timber harvested periodically on private forested lands was also considered. Southern Pine Beetle spots were used for their contribution to erosion. Coefficients for erosion and recovery rates were taken from the averages developed specifically for the Tuskegee National Forest in the Soil Erosion Calculation Process Record for the 1986 Land and Resource Management Plan.

Erosion values (from land use) were multiplied by a sediment delivery coefficient based on watershed size determined from Rhoel (1964). This model sums the total number of sediment tons from roads and calculates sediment from erosion delivered to the mouth of the watershed.

All values were summarized in a spreadsheet by watershed for the baseline sediment yield and current sediment yield (Forest Service and private). The acres of proposed activities are placed in the sediment spreadsheet for each alternative and year.

Data Interpretation

The summary worksheet of the sediment model calculates the baseline, current, and predicted sediment values for each watershed by alternative and year. To determine the potential cumulative effects of water quality and associated beneficial uses these sediment values are expressed as a percent increase over the baseline. The baseline assumes an undisturbed forest floor with no roads. It should be recognized that using such a baseline will result in high percentage increases since baseline values can indicate little to no erosion or sediment. The percentage values are only used as a mathematical index and should not be viewed as an indication of effects or impairment. This becomes more clear when the interpretation of this information is captured in a value added process call the Watershed Condition Rank (WCR) as described below.

Watershed Condition Rank

Watershed Condition Rank (WCR) is a measure that characterizes the condition of 5th level watersheds with respect to current and future sediment load increases. In order to establish WCRs, the current sediment average annual yield is determined and expressed as a percent above the baseline conditions. This provides a relative measure to determine changes within watersheds. The next step in this process is determined by using the relative abundance of locally adapted species with respect to predicted sediment increases to create a species-sediment load relationship or index (SSI). This score is modified by a weighted average where the watershed occurs in more than one physiographic zone. Watershed condition is generalized into three categories of excellent, average and below average.

From the WCR a series of determinations can be made that determine or assign additional Forest Objectives. The following section details the outcome of the WCR with respect to adverse effects on aquatic biota as they are related to forest management:

Where a watershed SSI is *excellent*, the probability (or potential) is **low** for adverse effects to aquatic species. If the results of forest alternatives remain within this range there should be no adverse effect on water quality with respect to beneficial uses (fish communities). Forest Service objectives would be to maintain or improve aquatic health through the implementation of riparian prescriptions.

Where a watershed SSI is *average*, the potential to adversely affect beneficial uses is **moderate**. Additional forest objectives should be considered. Examples of these additional objectives would be conducting watershed assessments during project planning to identify the source of the problem, and monitoring prior to project implementation to determine actual health of the biota.

Where a watershed with a SSI is *below average*, the potential to adversely affect beneficial uses is **high**. In addition to objectives listed above, Forest objectives at the project level would seek to maintain or restore watershed health and aquatic systems where the Forest Service can make meaningful contributions to watershed health. Apply prescriptions in the revised forest plan to correct the unhealthy situation.

The results of the WCR and other information can also be used to develop partnerships with other landholders or managers to improve overall watershed condition and improve aquatic health. This is one advantage of analyzing entire watersheds. Not only can Forest Service activities and contributing effects be isolated but other watershed effects can be identified as well.

Assumptions, uncertainties and limitations

Many assumptions are made throughout the sediment model and the WCR. Every effort has been made to describe those assumptions and minimize misrepresentation. With that in mind the application of the sediment model and associated WCR should not be taken as absolutes but as a method that can describe the effects from the range of alternatives and suggest where a greater risk with respect to water quality and aquatic biota exists.

Results of Analysis

Results of this analysis were similar if not somewhat better than was the findings in the Final EIS for the Revised Land and Resource Management Plan. As stated earlier, the Uphappe Creek and the Chewacla 5th level watersheds, the parent watersheds of those used for this analysis were found to have a moderate potential to adversely affect beneficial uses. The Choctafaula Creek, the Upper Uphappe Creek, and the Lower Chewacla Creek watersheds used for this analysis did not show as great a potential for adverse affects to beneficial uses. The reason for this is that the smaller watersheds have a greater percentage of Forest Service lands, which are predominately forested and have a lower potential for erosion and sedimentation. The results of the analysis do not indicate any adverse potential impacts to the three watersheds evaluated from any of the alternatives. The No Action Alternative would have the lowest potential for impacts. Alternative 3 has the next lowest potential for adverse impacts. Alternative 2 has only slightly higher potential for adverse impacts than does Alternative 3. The average change of percent over baseline for sediment for the nine years of the study is about 0.5% for the action alternatives. Peak years of sedimentation will be between 2007 and 2010 with sedimentation returning to the current conditions in 2012 for the action alternatives. Average percent over baseline for sediment for the peak years is about 0.9% for Alternative 2 and Alternative 3. Alternative 3, being thin only will have only slightly higher potential for impacts than does the No Action Alternative. Sedimentation will return to the current conditions in 2008 for Alternative 4.

Conclusions

Based on the finding of the cumulative effects analysis there is no indication of adverse affects to beneficial uses from the Proposed Action or any other Alternative thereof. Strict adherence to mitigations, State BMP's and Forest Standard will insure the continued support of down stream beneficial uses.

Monitoring

Temporary roads associated with thinning and restoration cuts are known to potentially affect water quality, water quantity, channel morphology, and down stream designated uses. Ten

percent of the total miles of temporary roads should be monitored to insure that mitigation measures are implemented and are effective. Should problems emerge a larger sample should be monitored and additional mitigation measures taken.

3.B Biological Elements

3.B.1 Major Habitat Groups

Affected Environment

The closest measure of community types the Forest Service maintains is an inventory of forest types. This inventory has been cross-walked to the community types described in **the *Guidance for Conserving and Restoring Old growth Forest Communities on National Forests in the Southern Region (USDA 1997)***. In order to evaluate management effects to wildlife habitats, forest types and communities have been categorized into habitat groups. Habitat groups represent a niche or condition relevant to wildlife species. An analysis of trends among habitat groups allows the potential effects of management on wildlife to be assessed. A complete description of each community type is located in the FEIS RLRMP, Chapter 3 and beginning on Page 3-75.

The Tuskegee National Forest contains a mosaic of forest stands spread across most of the landscape. It contains the major forest habitats of mesic deciduous forest, cypress-tupelo swamp, oak and oak-pine, but is predominantly pine and pine-oak forest and upland longleaf pine. Table 3.B.1-1 shows the habitat composition on the Tuskegee National Forest.

The area is made up of upland pine and pine-hardwood communities, and bottomland hardwoods. The community structure shows a wide age distribution with a number of various sized openings in the canopy. Vegetation patterns reflect natural disturbances, as well as planned harvest activities, to provide for forest health, old growth conditions, ecosystem restoration, wildlife habitat management, and other resource objectives. Evidence of natural disturbances, such as insects, disease, wind, and wildfire, are visible.

Table 3.B.1-1: Tuskegee National Forest Habitat Composition

Community	% of Forested Acres	Forest Types	% of community	Major Habitat Group
Dry and Dry-Mesic Oak-Pine Forest	36%	loblolly pine/hardwood (13)	8	Oak and Oak Pine
		loblolly pine (31)	90	
		shortleaf pine (32)	<1	
		southern red oak/yellow pine (44)	1	
		bear oak/southern scrub oaks/yellow pine (49)	1	
River Floodplain Hardwood Forest	34%	bottomland hardwood/yellow pine (46)	24	Mesic Deciduous
		sweet gum/yellow poplar (58)	33	
		Swamp chestnut oak/cherrybark oak (61)	41	
		sweet gum/nuttall oak/willow oak (62)	<1	

Community	% of Forested Acres	Forest Types	% of community	Major Habitat Group
		sugarberry/American elm/green ash (63) sweet bay/swamp tupelo/red maple (68)	1	
Upland Longleaf Pine Forests and Woodland	20%	longleaf pine (21)	100	Upland Longleaf
Wet Pine Forest, Woodlands, and Savannas	9%	slash pine (22)	100	Wet Pine Forests
Coastal Plain Upland Mesic Hardwood	1%	white oak/red oak/hickory (53)	100	Mesic Deciduous

Figure 3.B.1-2, shows the age class distribution for the Tuskegee National Forest. There is a distinct lack of early successional habitat forest wide. Table 3.B.1-3 depicts the age class distribution within the project area.

Figure 3.B.1-2: 2005 Forest Age Class Distribution

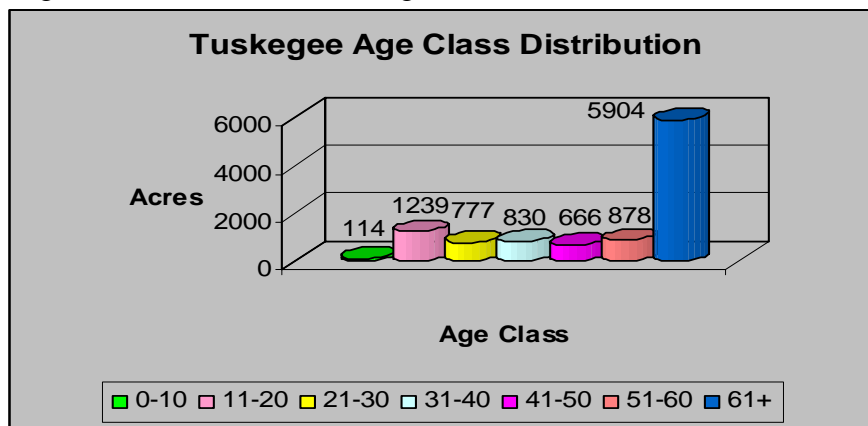
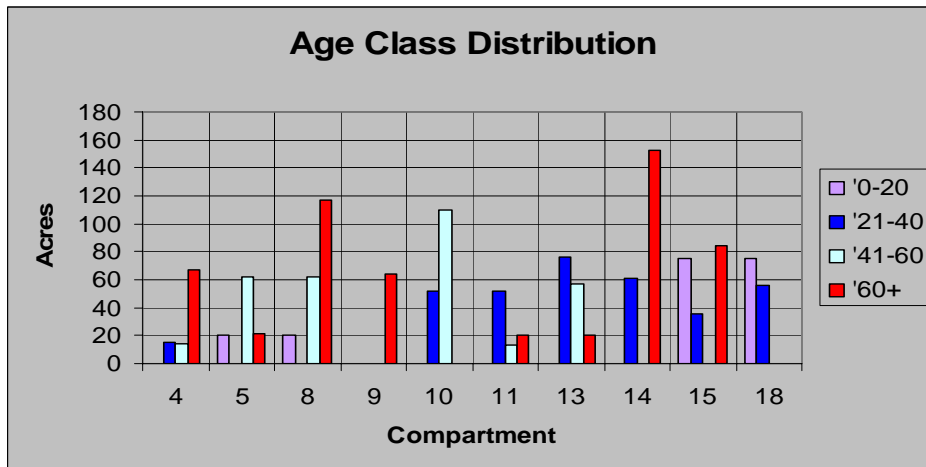


Chart 3.B.1-3: Age class distribution in the project area.



3.B.2 Understory Vegetation

The vegetative conditions of the understory plant communities vary. Many complex factors are interacting to affect the composition and structure of the forest understory. Overstory species and density, the presence, frequency and intensity of fire, chemical and physical properties of forest soils, hydrology, wildlife browse, and past management practices combine to influence the condition of forest understory of the area.

In general, the 864 acres of 41-61+ age class conifer stands have some characteristics of the traditional fire maintained longleaf pine/bluestem community, although these stands typically have a low occurrence of longleaf pine. These stands have occasional, scattered upland oaks, dogwood, common persimmon, sweetgum and water oak midstories. The understories are composed of low lying native grasses, herbs, wildflowers and shrubs. Blueberry, yaupon, bluestem, and bracken fern can be found in many of the stands to varying degrees.

The abundance of native grasses, herbs, and wildflowers within the 348 acres of 21-40 age class stands has an inverse relationship to overstory density present. Crown density has a direct relationship to Basal Area (BA) measurements. As measurements of BA increase, the presence of shade intolerant native grasses and wildflowers decrease. Shade tolerant shrubs/small trees, such as dogwood and wax myrtle, dominate the understory of stands with higher basal areas.

The condition, structure, and composition of the 190 acres of 0-20 age class stands are the most dynamic in nature. In the earliest stages of development, where fire has been introduced regularly, native grasses, herbs, and wildflowers heavily occupy the understories of these stands. The vertical arrangement of structure in these early successional plant communities allows the majority of the available photosynthetic energy to reach the forest floor. This abundance of available energy creates favorable conditions for a rich diversity of shade intolerant plant species to flourish.

Alternative 1 (No Action)

Direct and Indirect Effects

The No action alternative would have an overall negative effect on understory vegetation. Shade tolerant shrubs and trees will gain dominance in canopy openings where sun-loving grasses and forbs are growing and eventually shade them out. Invasive species such as kudzu will decrease the variety and density as it continues to blanket the landscape.

Although prescribed burning will continue, current fuel loadings dictates mostly dormant season burns to reduce the fuel levels. Dormant season burns favors woody plants while growing season burns favor grasses. There is enough top-kill during dormant season burns, to grow some grasses during the growing season.

Cumulative Effects

Alternative 1 would cause a decrease in grass and forage coverage in the Tuskegee National Forest. Invasive species will continue to cover more acres. No new early successional habitat will be created, where most understory diversity is found.

Alternative 2 (Proposed Action)

Direct and Indirect Effects

Selection of Alternative 2 will have a positive effect on understory vegetation. The harvesting of 796 acres and panting of longleaf pine will create the same amount of early successional habitat. Typically, the most understory diversity is found here.

Commercial thinning of 337 acres and the precommercial thinning of 40 acres will open the canopies of these stands, providing ample light for grasses and forbs to grow.

Alternative 2 also provides for the control and eradication of non-native invasive species. Control of these various species may be by herbicides and will eliminate shading of grasses and forbs where the invasive species occurs, providing additional acres of native grasses. Herbicides may be used as well as for site preparation to provide seedlings a free to grow condition.

Prescribed burning will continue with increasing emphasis placed on growing season burns.

Cumulative Effects

The creation of early successional habitat, commercial and precommercial thinnings insures a wide range of understory vegetation. Much of this vegetation will remain available until interspecies competition and crown closure keep sunlight from reaching the forest floor.

Control and eradication of non-native invasive species, will allow light to reach the ground on sites where these species are located. As control is achieved, native grasses will filter back and eventually gain control of the area.

Alternative 3 (No Herbicides)

Direct Indirect and Cumulative Effects

Alternative 3 will produce the same effects as Alternative 2, *except* that herbicides will not be used for site prep or to control non-native invasive species.

Alternative 4 (Thinning Only)

Direct Indirect and Cumulative Effects

This alternative will produce many of the same effects as Alternative 2. The commercial thinning of 450 acres will open the canopies of the selected stands. As sunlight reaches the forest floor, native grasses and forbs will grow. Since the use of herbicides is not proposed with this alternative, non-native invasive species will continue to spread, reducing the any overall increase in native vegetation.

Protection of Non-target Vegetation

Forest wide standards 19-31 (RLRMP, pages, 2-12 – 2-13) provide mitigating measures to reduce herbicide contact with non-target vegetation. Additional measures such as timing herbicide applications and use of selective herbicides provides additional protection to non-target plants.

3.B.3 Southern Pine Beetle and other Pathogens

Affected Environment

Insects and disease are important timber management concerns in Alabama. Several insects, diseases and pests have the potential to adversely affect vegetative, recreational, or aesthetic resources on the National Forests in Alabama. The best approach to managing insect and disease problems is to combine prevention and control strategies to meet natural resource management objectives (USDA Forest Service, 2001). This approach is called Integrated Pest Management (IPM) and involves techniques of pest prevention and suppression in an ecological context to hold pest population levels below those causing economic injury or adversely impacting other values (USDA Forest Service, 1985). Three primary groups of strategies used to manipulate the health of forests are prevention, conversion and, sanitation/risk reduction. Prevention uses proactive management to reduce the risk of forest pest problem occurrence. Conversion is a strategy in which high risk stands are replaced with stands having lower risk of adverse pest activity. Sanitation/risk reduction uses management strategies to reduce the risk of pests in a stand that will be retained or replaced later.

Though cyclical in population levels, the southern pine beetle, *Dendroctonus frontalis*, has caused significant losses in timber volume and value, and will continue to be a major cause of mortality in pine stands throughout the Tuskegee National Forest. Loblolly, Slash, and shortleaf pines are more susceptible to this beetle than longleaf pine. The Tuskegee National Forest has been through a recent period with epidemic levels of southern pine beetle infestations. Weather, predators, and insect parasites help to suppress southern pine beetle populations. IPM control measures usually include rapid cutting and removal of infested trees, piling and burning of infested trees, cutting and leaving trees, or cutting with chemical control in high value areas. Control options can be found in the *Final Environmental Impact Statement for the Suppression of the Southern Pine Beetle* (1987).

Littleleaf disease, caused by *Phytophthora cinnamomi*, occurs but is not a significant problem Tuskegee National Forest. This is a root disease associated with eroded clay soils with poor internal drainage. Littleleaf disease may become more significant as rotation ages are extended. Conversion of susceptible stands to a different species or younger pine stands would reduce the occurrence.

Fusiform rust, caused by *Cronartium fusiforme*, causes galls and cankers in loblolly and slash pine. These girdle young trees and increase breakage in older trees. Fusiform rust has not caused significant damage on the Tuskegee National Forest.

Loblolly pine decline, caused by a complex of conditions (stress and soil factors) is indicated by sparse crowns, chlorotic needles, reduced radial growth at age 40-50, root damage, and production of heavy cone crops prior to mortality, occurs in loblolly pine stands on the Tuskegee National Forest. The disease is associated with *Leptographium* spp. It is prevalent on sites with historic littleleaf disease, as well as on soils other than the heavy clay piedmont soils. Conversion of susceptible stands to a different species would reduce the occurrence.

All Alternatives

Direct and indirect effects

Integrated Pest Management (IPM) includes those activities that prevent, suppress, or lessen damage to forest stands from outbreaks of pest and disease organisms and will be utilized under all alternatives. The strategies commonly used under all alternatives are restoration and thinning. Restoration and maintenance projects respond to the forest health issue by restoring site specific suitable species composition, thinning to reduce crowding and prolong stand health until the stand composition and species can be restored, and the increased frequency of prescribed fire and in some cases the reintroduction of prescribed fire. As with all timber harvest activities, restoration and thinning will depend on management objectives. Stands are prioritized for treatment based on existing conditions. Those currently exhibiting signs and symptoms indicating insects, disease, mortality, or other forest health issues are priority for restoration. Because forest health affects other resources, addressing forest health issues also addresses wildlife habitat and recreation concerns. Recreation areas require periodic hazard tree analysis to detect and remove diseased stems in all alternatives.

Cumulative Effects

Tuskegee National Forest lands will be managed using IPM techniques for all alternatives. All alternatives use the same suppression guidelines to control insect and disease infestations. Control method effectiveness should not be expected to differ by alternative. Longer rotation will sift vegetation to a more mature condition and will likely increase risk of insects and disease over time. Effects of insects and disease on adjacent private lands would be similar for all alternatives with management actions taken to prevent the spread of insects and disease from national forest lands. Control of SPB infestations typically occurs on private lands in a similar manner to control operations on national forest land (removal or cut and leave).

3.B.4 Non-native Invasive Species

Affected Environment

On February 3, 1999, Executive Order #13112 was issued establishing the National Invasive Species Council, and directed Federal Agencies, using existing laws and other pertinent statutes, to prevent the introduction of invasive species, to provide for their control and to minimize the economic, ecological and human health impacts that invasive species cause. The invasive species threat has been identified by the Chief of the Forest Service as one of the four significant issues affecting National Forest System lands.

The accelerated spread of terrestrial and aquatic invasive species is one of the greatest natural resources concerns in the United States and their prevention and control is critical to the stewardship responsibility of the Forest Service. Invasive species know no boundaries – they span landscapes, ownerships and jurisdictions and are spreading at an estimated rate of 1.7 million acres per year across forests and grasslands. The cost to the United States is over \$137 billion each year. Invasive plants threaten ecosystem function, water availability, economic stability, forest production and human health. Second only to direct habitat destruction, invasive species are the greatest threat to native biodiversity and alter native communities, nutrient cycling, hydrology and natural fire. In 2001, \$18 million was spent nationally to treat 130,000 acres.

A number of Non-Native Invasive Species (NNIS) plants occur and thrive on the Tuskegee National Forest. District personnel, with approval and assistance of the Forest Botanist have compiled the list below as primary or target species to control and or eradicate within the Tuskegee National Forest. This list is shown in Table 3.B.4-3. Eradication and/or control methods may include weed-eating, mowing, hand removal, mechanical removal methods, herbicide application, bulldozing or a combination of these methods where they occur within stands selected for silvicultural treatment(s).

Table 3.B.4-1: Priority Invasive Species

Common Name	Scientific Name
Kudzu	<i>Pueraria lobata</i>
Cogongrass	<i>Imperata cylindrical</i>
Chinese Wisteria	<i>Wisteria sinensis</i>
Multiflora rose	<i>Rosa multiflora</i>
Japanese climbing fern	<i>Lygodium japonicum</i>
Chinese Privet	<i>Ligustrum sinense</i>
Mimosa/Silktree	<i>Albizia julibrissin</i>
Princess Tree/Royal Paulownia	<i>Paulownia tomentosa</i>
Serecia lespediza	<i>Lespedeza cuneata</i>
Bicolor lespediza	<i>Lespedeza bicolor</i>

Invasions of nonnative plants into southern forests, including the Tuskegee National Forest, continue to go uncontrolled. Invasive, nonnative plants have been characterized as “fire in slow motion” and 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. Some have been introduced into this country accidentally, but most were brought here as ornamentals, for erosion control or for livestock forage. These hardy plants arrived without their natural predators of insects and diseases that tend to keep native plants in natural balance. Now these nonnative plants increase across the landscape with little opposition and are often spreading out of control.

Every stand proposed for treatment contains some level of NNIS plant populations, with certain stands containing a large colony of one or more of the species listed below. All stands will receive treatment for existing sites as well as any additional discoveries of the target species. In addition, certain high probability of occurrence areas will be reviewed to determine if treatment is necessary. These include rights-of-way for forest roads, utilities, railroad, and interstate, with a view to joint control efforts, where possible.

For a list of herbicide mixes and target plants, refer to Table 1.5-2 on page 12 of this document.

Alternative 1 (No Action)

Direct, Indirect and Cumulative Effects

Under the No Action alternative, current management plans would continue to guide management of the project area. No control measures for invasive plant species would be implemented to accomplish project goals, and the plants would continue to spread, threatening native plant biodiversity and altering native communities.

Alternative 2 (Proposed Action)

Control Methods

This alternative proposes to control invasive plant species by using a variety of methods. These methods include the following:

1. The use of hand tools for grubbing (root removal) and cutting.
2. Mechanical treatment such as, mowing and blading and disking, to dislodge and expose roots.
3. Prescribed fire, with alternations in seasonal burning.
4. Herbicide application that will include one or more of the following: cut stump spray, foliar spray method, root crown method, and spot treatments using a backpack sprayer.

Control determinations will be made based on the following: degree of infestation - light to heavy, control in natural and high quality areas, areas near streams, ponds, wetlands, rare communities, ditches; non-crop areas such as fence rows and rights-of-way and residential areas.

The number of follow up treatments depends upon how well the plants are established and the persistence of the plants. The treatment method depends upon the physical location of the plant including surrounding vegetation, the physical size of the plant, the vigor of the plant, the plant species and the time of year the treatment is applied.

The following are types of herbicide treatment methods, classified in the Vegetation Management in the Appalachian Mountains EIS (VMEIS) as manual ground application methods, that would be utilized are as follows:

Directed Foliar Sprays – herbicide-water sprays, often with a non-ionic surfactant added, aimed at the target plant foliage to cover all leaves to the point of run off. They are usually applied with a backpack sprayer and plants up to 8 feet tall can be treated with this equipment.

Cut Surface Treatment

- Stem Injection (including hack-and-squirt) – herbicide mixtures or concentrates applied into downward incision cuts spaced around wood stems made by an ax, hatchet, machete, brush ax or tree injector. Injection is a selective method of controlling trees and shrubs which are greater than 2 inches in diameter.
- Cut Stump – herbicide concentrate or mixtures applied to the outer circumference of freshly cut stumps or the entire top surface of cut stems. Cutting the woody stems is usually accomplished by chainsaw or brush saw, but may be accomplished by hand saws or other hand-held cutting equipment. Herbicide is applied with a backpack sprayer, spray bottle, wick applicator or paint brush.

Basal Applications

- Full Basal Sprays – herbicide-oil-penetrant mixtures sprayed or daubed onto the lower portion of woody stems of trees or shrubs. They are applied using a backpack sprayer or a wick applicator, and are effective in controlling woody stems up to 6 inches in diameter.
- Modified Basal Sprays (streamline or thinline) - herbicide-oil-penetrant mixtures sprayed onto the lower portion of woody stems of trees or shrubs with a diameter of 2 inches or less

All herbicide use will follow the standards specified in the Vegetation Management in the Appalachian Mountains EIS (VMEIS). Refer to Chapter II, Section E(2)(c) of the VMEIS and the Mitigation Measures in this document. Separate risk assessments and product labels for these herbicides are located in the project file.

Direct and Indirect Effects

The use of hand tools will expose soil where they used to grub out roots. Use of mechanical means such as repeated mowing may eventually control some NNIS, but will not remove them from the landscape. This method would cause some soil compaction. Prescribed fire will help

control some NNIS, but will perpetuate others. Used properly herbicides will remove NNIS from the landscape.

If herbicide application is done during the growing season, plant foliage will wilt and turn brown, providing a sharp contrast against a green background. If the application is made during the fall, the browning of the foliage may coincide with the fall colors, softening the visual setting. Timing of the application will depend on many factors such as plant species and herbicide type. Non-target plants may be affected by drift, over-spray or splatter.

Cumulative Effects

The use of herbicides may cause browned vegetation to be seen from roads or trails, decreasing the visitor's forest experience. Long-term effects will positive because of the reduction of the amount of NNIS on the Tuskegee National Forest, reclaim habitat for rare communities, sensitive and locally rare species.

Alternative 3 (No Herbicide)

Direct and Indirect Effects

The use of hand tools will expose soil where they are used to grub out roots. Use of mechanical means such as repeated mowing may eventually control some NNIS, but will not remove them from the landscape. This method would cause some soil compaction. Prescribed fire will help control some NNIS, but will perpetuate others.

Cumulative Effects

Under the Thinning Only alternative, some invasive plant species would continue to spread, threatening native plant biodiversity and altering native communities.

3.B.5 Old Growth

Affected Environment

Old growth is widely acknowledged today as an essential part of managed forests, particularly on public lands. However, this concept is relatively new; evolving since the 1970's when a grassroots movement in the Pacific Northwest began in earnest to define old growth. In response to changes in public attitude, the U.S. Department of Agriculture, Forest Service began reevaluating its policy regarding old growth forests in the 1980's. Indeed, the ecological significance of old growth and its contribution to biodiversity were apparent. It was also evident that definitions were needed to adequately assess and manage the old growth resource. However, definitions of old growth varied widely among scientists. To address this discrepancy and other old growth issues, the National Old growth Task Group was formed in 1988. At the recommendation of this committee, old growth was officially recognized as a distinct resource by the Forest Service, greatly enhancing its status in forest management planning. The committee devised "The Generic Definition and Description of Old growth Forests" to serve as a

basis for further work and to ensure uniformity among Forest Service Stations and Regions. Emphasis was placed on the quantification of old growth attributes (Landers and Boyer, 1999).

The age at which old growth develops and the specific structural attributes that characterize old growth will vary widely according to forest type, climate, site conditions, and disturbance regime. Old growth in fire-dependent forest types may not differ greatly from young forests in the number of canopy layers or accumulation of downed woody material. However, old growth is typically distinguished from younger growth by several of the following attributes:

- Large trees for the species and site.
- Wide variation in tree sizes and spacing.
- Accumulations of large-sized dead standing and fallen trees that are high relative to earlier stages.
- Decadence in the form of broken or deformed tops or boles and root decay.
- Multiple canopy layers.
- Canopy gaps and understory patchiness.

In June 1997, the Region 8 Old-Growth Team published Guidance for Conserving and Restoring Old-Growth Forest Communities on National Forests in the Southern Region. Descriptions of 16 old-growth forest communities are found in this report. Table 3.B.5-1 shows the current possible old growth by community types for the Tuskegee National Forest. Total possible old growth includes stands over the minimum age in areas suitable for timber production and all acres in areas unsuitable for timber production.

Table 3.B.5-1: Current Possible Old Growth in acres on Tuskegee N.F.

Community Type and Minimum Age	Suitable over minimum age (acres)	Unsuitable (acres)	Total (acres)
Coastal Plain Upland Hardwood – 120	0	25	25
Dry and Dry Mesic Oak Pine – 100	104	376	480
River Flood Plain – 100	105	1777	1882
Upland Longleaf and South Florida Slash Pine – 110	19	227	246
Wet pine – 80	0	98	98
Total	228	2503	2731

Alternative 1 (No Action)

Direct and Indirect Effects

Under the No Action alternative, current management plans would continue to guide management of the project area. No management actions would be implemented to accomplish

project goals. The old growth characteristics and plant biodiversity of these communities will remain static or decrease slightly. Stands possessing old growth characteristics were not selected for management actions in this EA.

Cumulative Effects

Implementation of Alternative 1, may affect stands having Old Growth characteristics. In pine stands this would primarily be from SPB infestations from adjacent unhealthy stands. Hardwoods may eventually see an increased incidence of defoliators such as gypsy moth and oak wilt. Mature stands in Alabama, pine and hardwood stands are typically unhealthy having a high incidence of insect and disease infestations.

Alternative 2 (Proposed Action)

Direct and Indirect Effects

The land designated as unsuitable (inappropriate) for timber production will develop into stands predominantly over 100 years old. Some of those acres are in recreation areas and administrative sites which would not be able to retain old growth characteristics.

Riparian areas and steep areas provide for medium size areas and linkages.

Of the suitable areas, many will also develop into older stands. Suitable acres greater than 100 years old will provide for medium and small areas of potential old growth.

There will be no effect from herbicides on Old Growth. Stands possessing old growth characteristics were not selected for management actions in this EA.

Cumulative Effects

National Forest lands will be managed to provide old growth in accordance with the regional old growth guidance. Over time, the amount of old growth is expected to increase in all alternatives and the old growth will be distributed across the forest. The increase in old growth will provide habitat for those wildlife species that require older forest conditions but reduce habitat for those species requiring younger forest conditions.

Alternative 3 (No Herbicide)

Direct Indirect and Cumulative Effects

The effects of this alternative are the same as those discussed in Alternative 2.

Alternative 4 (Thinning Only)

Direct, Indirect and Cumulative Effects

The effects on Old Growth under Alternative 4 will be the same as discussed under Alternative 2.

3.B.6 Threatened, Endangered, Sensitive, & Locally Rare Species

3.B.6.1 Federally-listed Proposed, Endangered, and Threatened Species

Affected Environment

A Biological Analysis, sent to the U.S. Fish and Wildlife Service, was done to evaluate the Proposed Action potential effects to Federally-listed Proposed, Threatened, and Endangered species known or likely to occur within the influence of the project area. Ten terrestrial or aquatic animals, plants, or their designated Critical Habitats were deemed to be in need of evaluation as a result of the Proposed Action. Two main sources were consulted to determine the federally-listed species that needed to be evaluated for this project. The Daphne Ecological Services Office of the U.S. Fish and Wildlife Service maintains and annually updates a County listing of federally-listed species with known or potential occurrence within the county. For Macon County, USFWS listed the following species as in need of evaluation for potential project effects:

Macon

- E - Red-cockaded woodpecker *Picoides borealis*
- E - Wood stork *Mycteria americana*
- E - Southern clubshell mussel *Pleurobema decisum*
- E - Ovate clubshell mussel *Pleurobema perovatum*
- T - Fine-lined pocketbook mussel *Lampsilis altilis*

Notes: Bald eagles *Haliaeetus leucocephalus*, red-cockaded woodpeckers *Picoides borealis* and American peregrine falcons *Falco peregrinus anatum* may occur in any county, if suitable habitat exists.

USFWS Federally-Listed Species for Macon County. These species were evaluated in the Biological Analysis of the Proposed Action. Note: Suitable habitats for American peregrine falcons (high rocky precipices) do not exist in Macon County, therefore this species was not considered in the Biological Analysis.

The second source consulted for species to be evaluated with regard to potential Proposed Action effects was the Biological Analysis completed for the Revision of the Forest Land and Resource Management Plan (USFS, RLRMP BA, 2004.) This source added the following species to be evaluated: southern pigtoe, orange-nacre mucket, and relict trillium as federally listed species with known or potential distribution within the analysis area. The analysis area, defined as the area which wholly contains potential treatment effects of the Proposed Action was bounded for biological resources to Macon County for Terrestrial Species, and to Uphapee and Chewacla watersheds for aquatic species. Treatment stands were surveyed during May, June and July 2004, using walking transects. No federally listed or proposed species were found. Please see the BA for more detailed information.

Direct and Indirect Effects

No Action Alternative Effects – Under the “No Action” alternative no longleaf restoration activities (including regeneration harvests and site preparation treatments) would take place. Thinning of overstocked loblolly and slash stands for SPB risk reduction would not take place. Harvesting of stands affected by loblolly decline would not be implemented. Non-native

invasive species controls would not take place. Alternative 1, the “No Action” Alternative does not accomplish the Purpose and Need for this analysis. The “No Action” Alternative does not accomplish Forest Plan Objectives or Goals. Prescribe burning would continue; however prescribed fire alone, applied within Forest Plan Standards and prescribed thresholds, cannot move present ecosystem conditions towards desired future conditions.

The “No Action” Alternative would have the following potential effects on Federally-listed (Proposed, Endangered, and Threatened) Species:

- The red-cockaded woodpecker (RCW), as discussed in the BA, no longer occurs on the Tuskegee National Forest. It became locally extirpated during the early 1990’s. Tuskegee’s RCW extirpation was the result of unimpeded succession. Management treatments including, burning, thinning, and restoration could have averted this loss. Adequate habitats were not maintained to support the species. RCW do exist within counties adjacent to Macon County, and repatriation through emigration is possible if suitable habitats existed on Tuskegee NF. The “No Action” Alternative would not produce or maintain suitable RCW habitats within the project area.
- The “No Action” Alternative would not change conditions for the remaining species considered in the Biological Assessment.

Proposed Action Alternative Effects – The Proposed Action is to restore approximately 796 acres of off-site upland pine and pine-hardwood stands to longleaf pine by regeneration harvest and thin approximately 377 acres of generally younger and healthier, off-site upland pine plantations over the next 5 years. In Restoration stands relic longleaf and shortleaf pines will be marked and retained. In thinning stands, the residual basal area will be approximately 50 to 60 square feet per acre. Anticipated site preparations include mechanical, hand tool, fire and chemical methods (for more information, see Table of Contents for Appendix with listing of treatments by stand.) Non-native invasive plant species will be treated for control and/or eradication in some stands. Herbicides used for site preparation would be used on a grid pattern, except where non-native invasive plant species occur. For the treatment of non-native invasive plant species and site preparation, herbicide applications would be by foliar, basal and/or hack and squirt methods.

These are the determinations made for federally-listed species evaluated in the Biological Assessment:

Table 3.B.6.1-1: Determinations of Proposed Action effects from the Biological Assessment of Federally listed or proposed species.

Species	Status	Determination
Red-cockaded woodpecker (RCW)	endangered	No Effect
Bald eagle	threatened	No Effect
Wood stork	endangered	No Effect

Table 3.B.6.1-1: Determinations of Proposed Action effects from the Biological Assessment of Federally listed or proposed species (continued).

Species	Status	Determination
Southern pigtoe	endangered	No effect
Orange-nacre mucket	threatened	No effect
Southern clubshell	endangered	Not Likely to Adversely Affect
Ovate clubshell	endangered	Not Likely to Adversely Affect
Fine-lined pocketbook	threatened	Not Likely to Adversely Affect
Relict trillium	endangered	No Effect
Mobile Basin Mussels Critical Habitats	designated	Not Likely to Adversely Affect

Proposed Action implementation would only take place in accordance with Revised Forest Land and Resource Management Plan Standards. Forest Plan standards are applied as mandatory mitigations to all management treatments. The Proposed Action would have the following potential effects on Federally-listed (Proposed, Endangered, and Threatened) Species:

Regeneration and restoration treatments – Restoration harvests, replacing off-site loblolly and slash pine stands with longleaf pines, more suited to the site and native fire disturbance regimes would have potential beneficial effects to RCW. However, RCW have already been extirpated through loss of habitat to unimpeded succession, in the absence of natural fire regimes. A 1983 survey documented five RCW cluster sites on Tuskegee NF. One of the last three known RCW nest sites (Cluster #4 – Compartment 15, Stand 8) is proposed to be regenerated to longleaf in the Proposed Action. All relict and mature longleaf and shortleaf will be left during harvest. Managers will also leave all remaining tagged or banded RCW trees on site. Regeneration to longleaf, with reserved relict RCW trees, longleaf and shortleaf will improve potential habitats for future RCW colonization. However, because this emigration of RCW to Tuskegee NF would occur by chance, if at all, the BA made a determination of “No effect” for the species. Restored habitats on Tuskegee NF lands could provide important connective RCW habitats between population centers on Oakmulgee R.D. of Talladega NF and on Fort Benning.

The Biological Analysis made determinations of “Not likely to adversely affect” for most aquatic species. This determination was necessitated by remaining potential effects of sedimentation, after the application of forest-wide and riparian prescription standards. The effects of the Proposed Action, including regeneration harvests, with mandatory mitigations were characterized in the BA as “miniscule compared to other private land uses (terraforming, agriculture), and sedimentation downstream, while possible, is expected to be of short duration.” In other words, the indirect effects of silvicultural treatments to federally listed aquatic species (through water quality effects) are expected to be insignificant or discountable, and of short duration. The determination of “is not likely to adversely affect” requires written concurrence from the US Fish & Wildlife Service (FWS). *Insignificant* effects relate to size of the impact. Effects of restoration harvests, with forest-wide and riparian prescription standards applied as

mandatory mitigations, are expected to be so small, as to be insignificant. This determination is borne out by the analysis results for the watershed cumulative effects. *Discountable* effects are those extremely unlikely to occur. Sedimentation effects are extremely unlikely to occur under Proposed Action restoration and regeneration treatments mitigated by Forest Plan standards. Based upon best judgment, a person would not be able to meaningfully measure, detect or evaluate insignificant effects or expect discountable effects to occur.

Thinning harvests, both commercial and pre-commercial – Thinning harvests in upland pine stands, both commercially and pre-commercially, would have potential beneficial effects to RCW. However, RCW have already been extirpated through loss of habitat to unimpeded succession, in the absence of natural fire regimes. Thinned upland pine stands, burned to produce herbaceous ground covers, will improve potential habitats for future RCW colonization. However, because an emigration of RCW to Tuskegee NF would occur by chance, if at all, the BA made a determination of “No effect” for the species with regard to Proposed Actions. Restored woodland habitats, achieved by thinning and burning, on Tuskegee NF lands could provide important connective RCW habitats between population centers on Oakmulgee R.D. of Talladega NF and on Fort Benning.

The Biological Analysis made determinations of “Not likely to adversely affect” for most aquatic species. This determination was necessitated by remaining potential effects of sedimentation, after the application of forest-wide and riparian prescription standards. Thinning treatments contribute to sedimentation potential however the level of this potential is significantly lower than regeneration treatments. Please see the Water Resource analysis results for a complete explanation of relative contributions of component elements of the Proposed Action to sedimentation potentials. The total effects of the Proposed Action, including thinning treatments, with mandatory mitigations were characterized in the BA as “miniscule compared to other private land uses (terraforming, agriculture), and sedimentation downstream, while possible, is expected to be of short duration.” In other words, the indirect effects of silvicultural treatments to federally listed aquatic species (through water quality effects) are expected to be insignificant or discountable, and of short duration. The determination of “is not likely to adversely affect” requires written concurrence from the US Fish & Wildlife Service (FWS). *Insignificant* effects relate to size of the impact. Effects of thinning harvests, with forest-wide and riparian prescription standards applied as mandatory mitigations, are expected to be so small, as to be insignificant. This determination is borne out by the analysis results for the watershed cumulative effects. *Discountable* effects are those extremely unlikely to occur. Sedimentation effects are extremely unlikely to occur under Proposed Action thinning treatments mitigated by Forest Plan standards. Based upon best judgment, a person would not be able to meaningfully measure, detect or evaluate insignificant effects or expect discountable effects to occur.

Mechanical site preparation and vegetation control – Site preparation techniques employed, only determine the relative level of success in restoring the structure and function of native upland pine ecosystems that may serve as potential RCW habitats. Site preparation methods used are not expected to have effects on potential RCW habitats.

The Biological Analysis made determinations of “Not likely to adversely affect” for most aquatic species. This determination was necessitated by remaining potential effects of sedimentation,

after the application of forest-wide and riparian prescription standards. The effects of the Proposed Action, including mechanical site preparation and vegetation controls, with mandatory mitigations were characterized in the BA as “miniscule compared to other private land uses (terraforming, agriculture), and sedimentation downstream, while possible, is expected to be of short duration.” In other words, the indirect effects of silvicultural treatments to federally listed aquatic species (through water quality effects) are expected to be insignificant or discountable, and of short duration. The determination of “is not likely to adversely affect” requires written concurrence from the US Fish & Wildlife Service (FWS). *Insignificant* effects relate to size of the impact. Effects of mechanical site preparation, with forest-wide and riparian prescription standards applied as mandatory mitigations, are expected to be so small, as to be insignificant. This determination is borne out by the analysis results for the watershed cumulative effects, although mechanical site preparation is recognized as contributing higher potential sedimentation effect than chemical site preparation techniques. *Discountable* effects are those extremely unlikely to occur. Sedimentation effects are extremely unlikely to occur under Proposed Action restoration and regeneration treatments mitigated by Forest Plan standards. Based upon best judgment, a person would not be able to meaningfully measure, detect or evaluate insignificant effects or expect discountable effects to occur.

Chemical site preparation and non-native invasive species control by chemical – Site preparation techniques employed, only determine the relative level of success in restoring the structure and function of native upland pine ecosystems that may serve as potential RCW habitats. Site preparation methods used are not expected to have effects on potential RCW habitats, however, chemical site preparation treatments usually guarantee easier establishment of desired native pine species and better control of unwanted, off-site, hardwoods, such as maple and sweetgum. These effects would result in faster production of suitable RCW habitats. Since RCW no longer occur on Tuskegee no effects are possible to individual RCW. Effects here are evaluated for potentially suitable RCW habitats, should emigration be possible in the future. Non-native, invasive species control would have beneficial effects on potential future RCW habitats.

The Biological Analysis made determinations of “Not likely to adversely affect” for most aquatic species. This determination was necessitated by remaining potential effects of chemical contamination, after the application of forest-wide and riparian prescription standards. The effects of the Proposed Action, including chemical site preparation and non-native invasive species treatments, with mandatory Forest Plan standard mitigations were characterized in the BA as insignificant or discountable, and of short duration. The determination of “not likely to adversely affect” requires written concurrence from the US Fish & Wildlife Service (FWS). *Insignificant* effects relate to size of the impact. Effects of chemical site preparation and non-native invasive species controls, with forest-wide and riparian prescription standards applied as mandatory mitigations, are expected to be so small, as to be insignificant. This determination is borne out by the analysis results for the watershed cumulative effects. *Discountable* effects are those extremely unlikely to occur. Chemical contamination effects are extremely unlikely to occur under Proposed Action chemical site preparation and non-native invasive species control treatments mitigated by Forest Plan standards. Based upon best judgment, a person would not be able to meaningfully measure, detect or evaluate insignificant effects or expect discountable effects to occur.

Prescribed fire use and vegetation control and management – Fire is considered to be a natural event. Man-induced fire suppression has only occurred within the last 100 to 130 years. This period of fire suppression removed most RCW habitats. Resuming native fire regimes would improve the potential to produce suitable RCW habitats.

Prescribed burning is not known to have direct effects upon aquatic wildlife. In most instances the fire does not get into riparian areas to any large extent, due to character of riparian zone leaf litter. Fires naturally die-down as they approach wet areas. Streamside management zone standards (from the Forest Plan) will be followed for construction of fire control lines. Thus, direct physical damage to aquatic habitats would be prevented. Additional planning measures are taken to reduce the amount of fire control line construction. The Biological Analysis made determinations of “Not likely to adversely affect” for most aquatic species. This determination was necessitated by remaining potential effects of sedimentation, after the application of forest-wide and riparian prescription standards. The effects of the Proposed Action, including prescribed fire treatments, with mandatory mitigations were characterized in the BA as insignificant or discountable, and of short duration. The determination of “not likely to adversely affect” requires written concurrence from the US Fish & Wildlife Service (FWS). **Insignificant** effects relate to size of the impact. Effects of prescribed fires, with forest-wide and riparian prescription standards applied as mandatory mitigations, are expected to be so small, as to be insignificant. This determination is borne out by the analysis results for the watershed cumulative effects. **Discountable** effects are those extremely unlikely to occur. Sedimentation effects are extremely unlikely to occur under Proposed Action restoration and regeneration treatments mitigated by Forest Plan standards. Based upon best judgment, a person would not be able to meaningfully measure, detect or evaluate insignificant effects or expect discountable effects to occur.

Comparison of Alternative Effects – All action alternatives would be subject to Forest Plan standards. Forest Plan standards are applied as mandatory mitigations to all alternatives proposed. Therefore none of the action alternatives would be allowed to have significant negative effects to federally listed or proposed species.

Harvest levels and types in Alternative 3 do not differ from the Proposed Action. The only difference in Alternative 3 is the preclusion of herbicide use. No herbicides would be used for site preparation or non-native invasive plant species control. If non-native invasive plant species controls are feasible and attempted, they will be by mechanical methods such as mowing, cutting, and root grubbing. Prescribed fire may also be used to control some non-native invasive species, where feasible. Exclusion of herbicide use may require more aggressive use of prescribed fire and/or mechanical methods to accomplish site preparation.

Table 3.B.6.1-2.: Comparison of Alternatives.

	Alt. 1 No Action	Alt. 2 Proposed Action	Alt. 3 No Herbicide	Alt. 4 Thinning Only
Historic and Potential Future RCW Habitats	Native upland pine habitats would continue to succeed into mixed pine hardwood stands with dense midstory layers.	796 acres of native longleaf pine stands, which could serve as future potential RCW habitat would be restored.	796 acres of longleaf pine stands would be established. Woodland character (open, parklike with herbaceous understory) may be achieved on fewer acres, since control of off-site hardwoods and non-native invasive species will be less likely without herbicide.	Thinning (with prescribed burning) may restore woodland structure. Off-site pine species not adapted for long term, sustainable RCW habitat creation.
Aquatic T & E Species	Natural succession and normal background sedimentation rates would continue. No effect.	All proposed actions are not likely to adversely effect.	All proposed actions are not likely to adversely effect.	All proposed actions are not likely to adversely effect.

Alternative 4, proposes thinning only, to accomplish restoration of 450 acres within the longleaf pine ecosystem of the Tuskegee National Forest occurring over 2 years. Thinning treatments would be implemented in upland pine and pine hardwood stands containing 80 square feet of basal area per acre and higher. All of these stands were previously selected for treatment under the Proposed Action. Fewer acres and fewer proposed treatment stands are included in Alternative 4. No site preparation or non-native invasive species treatments would take place under Alternative 4. Residual basal area in thinned stands will vary from 40 to 60 square feet per acre. In stands with mature or relict longleaf and/or shortleaf trees; these trees will be left. Some natural regeneration of longleaf pine may occur within thinned stands if created gaps are large enough. Seed sources in treatment and adjacent stands may be adequate to allow natural regeneration of longleaf in isolated areas. Prescribed fire will be used to encourage “site preparation” for natural regeneration and to encourage the development of an herbaceous, pyrophytic native grass and herb groundcover. Herbicides will not be used in Alternative 4.

Cumulative Effects

Cumulative effects of the Proposed Action and all of the action alternatives are negligible when all project mitigations are applied. Project mitigations are the Forest Plan standards. Restoration harvests, thinning harvests, temporary access management, and prescribed burning, in addition to other Forest Service management programs for recreational uses of the forest, are mitigated, by Forest Plan design, through Forest Plan standards. No cumulative effects are expected as a result of these Proposed Actions or programs. The Biological Assessment also reports no cumulative effects are expected.

3.B.6.2 Regional Forester's Sensitive Species, Locally Rare Species, Rare Communities, and Aquatic Habitats

Affected Environment

Sensitive Species are species “identified by a Regional Forester for which population viability is a concern...” (FSM 2670.5(19)). The Regional Forester’s list of Sensitive Species is periodically updated to reflect improved knowledge of species’ status and to focus on those species most at risk. The most recent Regional Forester’s Sensitive Species, for the Southern Region (Region 8) list was issued August 7, 2001. All species on that list that occur, or potentially occur, on the Tuskegee National Forest are evaluated in the Biological Evaluation of Regional Forester’s Sensitive Species. This policy is designed to avoid impacts that may cause a trend toward listing of a species under the Endangered Species Act, or loss of species viability. This BE relies heavily on the terrestrial and aquatic species viability analysis done in support of the EIS for the Forest Plan Revision and the Biological Evaluation done in support of the Forest Plan EIS.

Table 3.B.6.2-1: Regional Forester’s Sensitive Species evaluated in Proposed Action Biological Evaluation

<i>Scientific Name</i>	Common Name	Status¹	Taxonomic Group	Tuskegee NF Distribution
<i>Pituophis melanoleucus mugitus</i>	Florida pine snake	S	Reptile	FP
<i>Ursus americanus floridanus</i>	Florida black bear	S	Mammal	FP
<i>Corynorhinus rafinesquii</i>	Rafinesque's big-eared bat	S	Mammal	FP
<i>Myotis austroriparius</i>	Southeastern myotis	S	Mammal	FP
<i>Aimophila aestivalis</i>	Bachman's sparrow	S	Bird	F2
<i>Baptisia megacarpa</i>	Apalachicola wild indigo	S	Vasc. Plant	Moist woodlands, ravine slopes, stream banks
<i>Hexastylis speciosa</i>	Harper's heartleaf	S	Vasc. Plant	Seeps, springs, moist woodlands
<i>Hymenocallis caroliniana</i> (= <i>H. coronaria</i>)	Carolina spider lily	S	Vasc. Plant	Stream banks, moist woodlands, streams
<i>Rudbeckia heliopsisidis</i>	Sunfacing coneflower	S	Vasc. Plant	Transition from riparian to longleaf pine
<i>Crystallaria asperella</i>	Crystal darter	S	Fish	Rare
<i>Etheostoma parvapium</i>	Goldstripe darter	S	Fish	Rare
<i>Etheostoma zonifer</i>	Backwater darter	S	Fish	Rare
<i>Notropis uranoscopus</i>	Skygazer shiner	S	Fish	Abundant
<i>Percina lenticula</i>	Freckled darter	S	Fish	Sparse
<i>Anodontoides radiatus</i>	Rayed creekshell	S	Mussel	Locally common
<i>Lasmigona complanta alabamensis</i>	Alabama heelsplitter	S	Mussel	Common
<i>Neurocordulia molesta</i>	Smokey showdragon	S	Insect	Uncommon
FP=Forest Potential-No known occurrences, F1=0-5 Known Occurrences, F2=6-20 Known Occurrences, F3=21-100 Known Occurrences on Tuskegee NF				
¹ Status: E = endangered; T = threatened; P = proposed; C = candidate; S = sensitive (2001 Regional Forester’s List)				

Species of viability concern include federally listed species, Regional Forester's Sensitive Species, and locally rare species. A comprehensive list of species with potential viability concern was compiled for each management unit of the National Forests in Alabama, including Tuskegee NF, for the Forest Plan revision analysis by Forest Service biologists. Potentially limiting habitat requirements of each species were also identified. Because viability regulations (NFMA and USDA regulation 9500-004) focus on the role of habitat management in providing for species viability, habitat characters were the primary factors used to drive species viability evaluation. Not surprisingly, many species of viability concern share needs for certain habitat elements that have become rare in the landscape. Many of these rare habitat elements are components of rare communities. Many rare communities are components of, or associated with, wetlands, riparian areas, or aquatic habitats. Therefore, for locally rare species, and for species of viability concern in general, the habitat element (or rare community) abundance, distribution, and condition effects adequately reflect potential species effects. Many rare communities and the viability concern species they could support do not occur within the topographic features of upland pine and pine-hardwood stands. Rare communities not affected by management proposals are not discussed herein. Please see the BE for more information regarding sensitive species and rare communities.

Direct and Indirect Effects

No Action Alternative Effects – Under the “No Action” alternative no longleaf restoration activities (including regeneration harvests and site preparation treatments) would take place. Thinning of overstocked loblolly and slash stands for SPB risk reduction would not take place. Harvesting of stands affected by loblolly decline would not be implemented. Non-native invasive species controls would not take place. Alternative 1, the “No Action” Alternative does not accomplish the Purpose and Need for this analysis. The “No Action” Alternative does not accomplish Forest Plan Objectives or Goals. Prescribe burning would continue; however prescribed fire alone, applied within Forest Plan Standards and prescribed thresholds, cannot move present ecosystem conditions towards desired future conditions.

The “No Action” Alternative would have the following potential effects on Regional Forester's Sensitive Species, Locally Rare Species, Rare Communities, and Aquatic Habitats:

- Aquatic habitats, rare communities (excluding woodlands, savannas, and Sandhills), and wetland associated locally rare and sensitive species population characteristics and habitat distributions will remain unchanged under the “no action” alternative.
- Sensitive species, locally rare species, and rare communities requiring disturbance will continue to decline under the “no action” alternative. Longleaf woodlands, woodlands in general, cane thickets, and many other rare communities require disturbance, which can be duplicated by silvicultural treatments and prescribed burning.

Proposed Action Alternative Effects – The Proposed Action is to restore approximately 796 acres of off-site upland pine and pine-hardwood stands to longleaf pine by regeneration harvest and thin approximately 377 acres of generally younger and healthier, off-site upland pine plantations over the next 5 years. In Restoration stands relic longleaf and shortleaf pines

will be marked and retained. In thinning stands, the residual basal area will be approximately 50 to 60 square feet per acre. Anticipated site preparations include mechanical, hand tool, fire and chemical methods (for more information, see Table of Contents for Appendix with listing of treatments by stand.) Non-native invasive plant species will be treated for control and/or eradication in some stands. Herbicides used for site preparation would be used on a grid pattern, except where non-native invasive plant species occur. For the treatment of non-native invasive plant species and site preparation, herbicide applications would be by foliar, basal and/or hack and squirt methods.

The Proposed Action and its action alternative potential treatment effects will be mitigated by mandatory application of Forest Plan Standards. Determinations represent the overall expected effect of Proposed Action implementation on each Sensitive Species. Determinations in this document reflect the effect of National Forest management actions only. Because ecological sustainability, native ecosystem restoration, and species viability were one of the primary drivers used to define Forest Plan goals, objectives, and standards (implemented by the Proposed Action), it is expected that treatment effects to most Sensitive Species will be beneficial.

The Proposed Action would have the following potential effects on Regional Forester's Sensitive Species, Locally Rare Species, Rare Communities, and Aquatic Habitats:

Table 3.B.6.2-2: Summary of Determinations for Regional Forester's Sensitive Species

Scientific Name	Common Name	Determination of Effects
<i>Pituophis melanoleucus mugitus</i>	Florida pine snake	may impact individuals but not likely to cause a trend toward listing or a loss of viability
<i>Ursus americanus floridanus</i>	Florida black bear	Beneficial effects
<i>Corynorhinus rafinesquii</i>	Rafinesque's big-eared bat	may impact individuals but not likely to cause a trend toward listing or a loss of viability
<i>Myotis austroriparius</i>	Southeastern myotis	may impact individuals but not likely to cause a trend toward listing or a loss of viability
<i>Aimophila aestivalis</i>	Bachman's sparrow	may impact individuals but not likely to cause a trend toward listing or a loss of viability
<i>Baptisia megacarpa</i>	Apalachicola wild indigo	may impact individuals but not likely to cause a trend toward listing or a loss of viability
<i>Hexastylis speciosa</i>	Harper's heartleaf	No impact
<i>Hymenocallis caroliniana</i> (= <i>H. coronaria</i>)	Carolina spider lily	may impact individuals but not likely to cause a trend toward listing or a loss of viability
<i>Rudbeckia heliopsidis</i>	Sunfacing coneflower	may impact individuals but not likely to cause a trend toward listing or a loss of viability; beneficial effects
<i>Crystallaria asperella</i>	Crystal darter	may impact individuals but not likely to cause a trend toward listing or a loss of viability

Table 3.B.6.3.-2: Summary of Determinations for Regional Forester's Sensitive Species
(continued)

Scientific Name	Common Name	Determination of Effects
<i>Etheostoma parvpinne</i>	Goldstripe darter	may impact individuals but not likely to cause a trend toward listing or a loss of viability
<i>Etheostoma zonifer</i>	Backwater darter	beneficial impacts
<i>Notropis uranoscopus</i>	Skygazer shiner	may impact individuals but not likely to cause a trend toward listing or a loss of viability
<i>Percina lenticula</i>	Freckled darter	may impact individuals but not likely to cause a trend toward listing or a loss of viability
<i>Anodontooides radiatus</i>	Rayed creekshell	may impact individuals but not likely to cause a trend toward listing or a loss of viability
<i>Lasmigona complanta alabamensis</i>	Alabama heelsplitter	may impact individuals but not likely to cause a trend toward listing or a loss of viability
<i>Neurocordulia molesta</i>	Smokey showdragon	may impact individuals but not likely to cause a trend toward listing or a loss of viability

Regeneration and restoration treatments – Restoration treatments are aimed at upland stands or portions of stands that are in uplands. Many upland pine and pine-hardwood stands proposed for treatment contain streamside zones. Streamside zones, or riparian portions of stands, are not targeted for restoration treatments. Regeneration harvests, mitigated by forest wide and riparian prescription standards, are neutral to aquatic habitats, riparian associate species, and wetland associated rare communities. No significant effects are expected to these components. However, residual potential effects are related to sedimentation, which may contribute insignificant, immeasurable amounts of sediment for a short duration of time the aquatic habitats. Short term negative effects are expected to be less than the beneficial effects of native ecosystem restoration.

Upland sensitive species, such as the sun-facing coneflower and Bachman's sparrow may experience short-term negative effects to individuals, but long term benefits to their populations as fire-maintained longleaf uplands are restored.

Thinning harvests, both commercial and pre-commercial – Streamside management zone, riparian corridor and forest wide standards, applied as mandatory mitigations to the thinning harvest treatments will make effects to aquatic habitats, wetland rare communities, and riparian-associate, locally rare and sensitive species neutral to these elements. No significant effects are expected to these components. However, residual potential effects are related to sedimentation, which may contribute insignificant, immeasurable amounts of sediment for a short duration of time the aquatic habitats. Short term negative effects are expected to be less than the beneficial effects of woodland structure restoration. Thinnings allow the development of an herbaceous ground cover and therefore improves habitat conditions for locally rare plant species and woodland associate species.

Mechanical site preparation and vegetation control – Mechanical site preparation treatments are limited by Forest Plan standards to take place outside riparian corridors, streamside management zones, and steep slopes and erosive soils. These restrictions will protect most riparian associate, wetland rare community, and aquatic habitats from potential treatment effects. No significant effects are expected to these components. However, residual potential effects are related to sedimentation, which may contribute insignificant, immeasurable amounts of sediment for a short duration of time to aquatic habitats. Short term negative effects are expected to be less than the beneficial effects of native ecosystem restoration. Mechanical site preparation treatment effects are aimed at the upland pine and pine-hardwood portion of treatment stands.

Chemical site preparation and non-native invasive species control by chemical –Forest Plan forest wide, streamside management zone, and riparian corridor prescription standards will protect most riparian associate, wetland rare community, and aquatic habitats from potential chemical site preparation and non-native invasive species control treatment effects. No significant effects are expected to these components. However, residual potential effects are related to potential chemical contamination of streams and chemical treatment of non-target species. These may contribute insignificant, immeasurable effects to water quality for a short duration of time. Short term negative effects are expected to be less than the beneficial effects of native ecosystem restoration. Chemical site preparation treatment effects are aimed at the upland pine and pine-hardwood portion of treatment stands. Chemical herbicide treatments are especially efficacious in establishing upland pine ecosystems where previous management allowed the development of off-site hardwood rootstocks. When the previous stand included mature off-site hardwoods, such as red maple and sweetgum, herbicides are needed to reclaim the site. Prescribed fires usually do not reach the intensity or frequency necessary to deplete and remove the numerous stump sprouts each previous stem will produce. For upland longleaf ecosystem restoration, woodland structure restoration, sandhill reclamation, and the restoration of rare community and sensitive species and locally rare species release, chemical herbicides produce beneficial habitat effects. Herbicides do kill sensitive plant species if they are sprayed directly on leaf surfaces. However, herbicide applications are also limited by Forest Plan standards. Proposed Action applications are limited to directed foliar, cut stem, and individual basal stem sprays. These applications are done by hand and are very selective. Over spray is limited by economics to a great extent. Herbicides are relatively costly, and application protocols seek the lightest application that will kill target stems. However, the residual potential of over-spray onto viability concern plant species that were not found and protected during surveys, necessitated the determination made in the BE for Regional Forester's Sensitive Species.

Prescribed fire use and vegetation control and management – Fire is considered to be a natural event. Man-induced fire suppression has only occurred within the last 100 to 130 years. This period of fire suppression removed most woodland structured forest stands. Woodlands existed in longleaf pine, shortleaf pine and in pine oak mixes. Resuming native fire regimes would improve the potential to produce woodland and savanna habitats. Sandhills and other rare communities would be benefited by prescribed fire use.

Prescribed burning is not known to have direct effects upon aquatic habitats. In most instances the fire does not get into riparian areas to any large extent, due to character of riparian zone leaf litter. Fires naturally die-down as they approach wet areas. Streamside management zone standards (from the Forest Plan) will be followed for construction of fire control lines. Thus, direct physical damage to aquatic habitats and riparian related rare communities would be prevented. Canebrakes are benefited by prescribed burning. Additional planning measures are taken to reduce the amount of fire control line construction. The Biological Evaluation made determinations of “may impact individuals but not likely to cause a trend toward listing or a loss of viability” for most aquatic species. This determination was necessitated by remaining potential effects of sedimentation, after the application of forest-wide and riparian prescription standards. The effects of the Proposed Action, including prescribed fire treatments, with mandatory mitigations were characterized in the BE as insignificant or discountable, and of short duration. Negative effects of prescribed fires to non-target habitats, with forest-wide and riparian prescription standards applied as mandatory mitigations, are expected to be small and short-term. Benefits to rare communities restored, and viability concern species potentially expanded are expected to be long-term and greater than negative effects. Sedimentation effects are extremely unlikely to occur under Proposed Action prescribed burning treatments mitigated by Forest Plan standards.

Comparison of Alternative Effects - All action alternatives would be subject to Forest Plan standards. Forest Plan standards are applied as mandatory mitigations to all alternatives proposed. Forest Plan standards were devised to protect the habitat needs of viability concern species. The concept of the Rare Community Prescription and the Riparian Corridor Prescription was conceived to protect the recognized values of those communities. Potential negative effects to Regional Forester’s Sensitive species, locally rare species, rare communities, and aquatic habitats will be mitigated by protective Forest Plan Standards under all action alternatives.

Harvest levels and types in Alternative 3 do not differ from the Proposed Action. The only difference in Alternative 3 is the preclusion of herbicide use. No herbicides would be used for site preparation or non-native invasive plant species control. If non-native invasive plant species controls are feasible and attempted, they will be by mechanical methods such as mowing, cutting, and root grubbing. Prescribed fire may also be used to control some non-native invasive species, where feasible. Exclusion of herbicide use may require more aggressive use of prescribed fire and/or mechanical methods to accomplish site preparation.

Alternative 4, proposes thinning only, to accomplish restoration of 450 acres within the longleaf pine ecosystem of the Tuskegee National Forest occurring over 2 years. Thinning treatments would be implemented in upland pine and pine hardwood stands containing 80 square feet of basal area per acre and higher. All of these stands were selected for treatment under the Proposed Action. Fewer acres and fewer proposed treatment stands are included in Alternative 4. No site preparation or non-native invasive species treatments would take place under Alternative 4. Residual basal area in thinned stands will vary from 40 to 60 square feet per acre. In stands with mature or relict longleaf and/or shortleaf trees; these trees will be left. Some natural regeneration of longleaf pine may occur within thinned stands if created gaps are large enough. Seed sources in treatment and adjacent stands may be adequate to allow natural regeneration of longleaf in isolated areas. Prescribed fire will be used to encourage “site

preparation” for natural regeneration and to encourage the development of an herbaceous, pyrophytic native grass and herb groundcover. Herbicides will not be used in this alternative.

Table 3.B.6.2-3: Comparison of Alternatives.

	Alt. 1 No Action	Alt. 2 Proposed Action	Alt. 3 No Herbicide	Alt. 4 Thinning Only
Disturbance - dependant Rare Communities and their Sensitive and Locally Rare Species	Upland Longleaf Woodland Ecosystem not restored. Sandhill and Canebrake Rare Community not Restored. Understories dense and woody, few containing grasses, limiting sensitive and locally rare plant species expansions. Normal successional changes continue to reduce the quality and quantity of disturbance dependant rare communities.	Upland Longleaf Woodland Ecosystem restored on 796 acres. Sandhill and Canebrake Rare Community Restored by thinning and fires. Herbaceous understories encouraged on 377 acres, providing opportunity for sensitive and locally rare plant species expansions.	Upland Longleaf Woodland Ecosystem potentially restored on 796 acres. Sandhill and Canebrake Rare Community restored by thinning and fires. Herbaceous understories encouraged on 377 acres providing opportunity for sensitive and locally rare plant species expansions. More hardwood competition remains. More non-native invasive species remain.	Herbaceous understories encouraged on 377 acres providing opportunity for sensitive and locally rare plant species expansions. More non-native invasive species remain as competition.
Riparian and wetland associated Rare Communities and their Sensitive and Locally Rare Species	No change to riparian, or wetland associated rare communities.	No change to riparian, or wetland associated rare communities.	No change to riparian, or wetland associated rare communities.	No change to riparian, or wetland associated rare communities.
Riparian and Aquatic Communities	No change to riparian, or aquatic habitats.	Slight risk of sedimentation and chemical contamination of water quality. BE rated potential short term negative effects as lesser than long term potential benefits of ecosystem restoration.	Slight risk of sedimentation contamination of water quality.	Very slight risk of sedimentation contamination of water quality.

Cumulative Effects

Cumulative effects of the Proposed Action and all of the action alternatives are negligible when all project mitigations are applied. Project mitigations are the Forest Plan standards. Restoration harvests, thinning harvests, temporary access management, and prescribed burning, in addition to other Forest Service management programs for recreational uses of the forest, are mitigated, by Forest Plan design, through Forest Plan standards. No cumulative effects are expected as a result of these Proposed Actions or existing programs. The Biological Evaluation also reports no cumulative effects are expected.

3.B.7 Wildlife Resources

3.B.7.1 Management Indicator Species, Major Habitat Groups and Terrestrial Habitats

Affected Environment

The purpose and need for the Proposed Action originates when inventory results produce results different from desired conditions expressed in Forest Plan objectives and goals. Forest Plan objectives resulted from prioritized species (federally listed, Regional Forester’s sensitive species, locally rare species) and habitat needs, used to develop management objectives. Forest health and native ecosystem restoration; to restore upland longleaf ecosystems and woodland structure to appropriate upland forest types, to reduce southern pine beetle and other disease and

pest susceptibilities, and to increase landscape level diversity by restoring, protecting and enhancing rare communities, are the main objectives of the Forest Plan.

Management Indicator Species (MIS) are species selected “because their population changes are believed to indicate the effects of management activities” (36 CFR 219 (a)(1)). MIS are to be used in during planning to help compare effects of alternatives, and as a focus for monitoring. Twelve MIS were chosen for National Forests in Alabama; ten of these MIS occur on Tuskegee NF. Five MIS occurring on Tuskegee NF provide the basis of meaningful treatment effects comparisons. Red-cockaded woodpeckers do not occur on Tuskegee NF. Scarlet tanagers are not MIS for Tuskegee NF. Pileated woodpeckers do not produce meaningful comparisons of treatment effects because Forest Plan snag retention standards insure that harvest treatments do not change necessary habitat elements for this MIS. Forest Plan spatial analyses of fragmentation effects potentials did not indicate any areas of risk for Tuskegee NF. Restoration harvests are temporary removals of small areas of forest, in a matrix the Forest Plan landscape-level analysis revealed was a mostly forested region. For these reasons the Wood Thrush would not produce meaningful comparisons of treatment effects. The habitats for which Acadian flycatchers, Swainson’s warblers, and hooded warblers, are indicators are not the focus of management treatments; therefore these species would not serve as adequate MIS for Proposed Actions.

The following species are MIS chosen to compare effects of the Proposed Action and its alternatives:

Table 3.B.7.1-1.: Management Indicator Species chosen for Tuskegee Forest Health and Longleaf Restoration Project

Common Name	Reason for Selection Of Management Indicator For Proposed Action and Alternatives	Related LRMP Objectives
White-tailed deer	To help indicate management effects on meeting hunting demand for this species.	1.2, 16.3
Eastern wild turkey	To help indicate management effects on meeting hunting demand for this species.	1.2, 16.3
Northern bobwhite quail	To help indicate management effects on meeting hunting demand for this species.	1.2, 1.4, 1.5, 16.1, 18.1
Brown-headed nuthatch	To help indicate management effects on the pine and pine-oak forest community.	1.2, 1.4, 1.5, 16.1
Prairie Warbler	To help indicate management effects on creating and maintaining early successional forest (low elevation) communities and other early successional habitats.	1.2, 16.4

In 2001 National Forests in Alabama’s Planning Team produced a draft Supplemental MIS Report. Although the draft was completed, it was not released because the decision was made to devote all planning team efforts to completing Forest Plan revision instead. The draft Supplemental MIS report summarized data regarding management indicator species chosen in the first round of Forest Planning. No data were available for deer, turkeys, or quail on Tuskegee NF, since the report relied on harvest data and spotlight survey data gathered on State Wildlife Management Areas occurring on National Forests. Tuskegee is the only management unit of National Forests in Alabama without a WMA located on it. Breeding Bird Survey data collected

on the Tuskegee National Forest for brown-headed nuthatch was highly variable; however, it appeared that the population was stable between 1982 and 1992 then began to decline (USFS, Draft Supplemental MIS Report 2001). The brown-headed nuthatch (*Sitta pusilla*) requires mature, relatively open, pine stands. This species' habitat requirements are similar to that of the endangered red-cockaded woodpecker (RCW). Please see the discussion of Tuskegee former RCW population in the Federally-listed Species Section. Brown-headed nuthatches are often seen in RCW colony sites. Since the loss of Tuskegee's last RCW Cluster, documented in 1992, prescribed burning impetus and woodland structure maintenance and creation also declined. The decline of brown-headed nuthatch follows the same pattern. Prairie Warbler populations were not reported in the 2001 report since it was not an MIS at that time. Beginning in May 2005, Tuskegee breeding birds will be surveyed by point counts as the remaining management units are surveyed. Game MIS will be surveyed by Incidental Observation Indices, beginning in 2005.

Another changing metric that will be monitored at the Forest Plan level is the change in major forest communities. The proposed action would remove off-site loblolly and slash pine stands and restore longleaf pine to native sites. This would partially accomplish Objective 1.2 of the Forest Plan. Forest Plan monitoring of forest community distributions would show a decrease in the proportion of Dry and Dry-Mesic Oak-Pine Forest and Wet Pine Forest, Woodlands, and Savannas communities and an increase in Upland Longleaf Pine Forests and Woodlands. Proposed Action management treatments will affect changes in available wildlife habitats as well. These changes will be evaluated through a comparison of treatment effects on MIS and major habitats.

Table 3.B.7.1-2: Community changes resulting from Proposed Action treatments

Community	% of Forested Acres	Forest Types	% of community	Major Habitat Group
Dry and Dry-Mesic Oak-Pine Forest	36%	loblolly pine/hardwood (13) loblolly pine (31) shortleaf pine (32) southern red oak/yellow pine (44) bear oak/southern scrub oaks/yellow pine (49)	8 90 <1 1 1	Oak and Oak Pine
Upland Longleaf Pine Forests and Woodland	20%	longleaf pine (21)	100	Upland Longleaf
Wet Pine Forest, Woodlands, and Savannas	9%	slash pine (22)	100	Wet Pine Forests

Direct and Indirect Effects

No Action Alternative Effects – Under the “No Action” alternative no longleaf restoration activities (including regeneration harvests and site preparation treatments) would take place. Thinning of overstocked loblolly and slash stands for SPB risk reduction would not take place. Harvesting of stands affected by loblolly decline would not be implemented. Non-native invasive species controls would not take place. Alternative 1, the “No Action” Alternative does not accomplish the Purpose and Need for this analysis. The “No Action” Alternative does not

accomplish Forest Plan Objectives or Goals. Prescribe burning would continue; however prescribed fire alone, applied within Forest Plan Standards and prescribed thresholds, cannot move present ecosystem conditions towards desired future conditions.

The “No Action” Alternative would have the following potential effects on Management Indicator Species, Major Habitat Groups, and Terrestrial Habitats:

- Upland Longleaf ecosystem restoration, woodland structure restoration, rare community restorations, and associated wildlife species habitat restorations would not take place.
- Successional changes, under landscape-level fire suppressions, would continue, resulting in fewer habitats suitable for northern bobwhite quail and brown-headed nuthatches.
- No habitats would be created or maintained for early successional habitat associates, such as the prairie warbler. Currently there are fewer than 100 acres in the 0-10 year old forest age class. By 2007 all of these acres will be 11 years old or older, leaving no habitats on the entirety of Tuskegee NF for these species.

Proposed Action Alternative Effects – The Proposed Action is to restore approximately 796 acres of off-site upland pine and pine-hardwood stands to longleaf pine by regeneration harvest and thin approximately 377 acres of generally younger and healthier, off-site upland pine plantations over the next 5 years. In Restoration stands relic longleaf and shortleaf pines will be marked and retained. In thinning stands, the residual basal area will be approximately 50 to 60 square feet per acre. Anticipated site preparations include mechanical, hand tool, fire and chemical methods (for more information, see Table of Contents for Appendix with listing of treatments by stand.) Non-native invasive plant species will be treated for control and/or eradication in some stands. Herbicides used for site preparation would be used on a grid pattern, except where non-native invasive plant species occur. For the treatment of non-native invasive plant species and site preparation, herbicide applications would be by foliar, basal and/or hack and squirt methods.

The Proposed Action would have the following potential effects on Management Indicator Species, and Major Habitat Groups:

Regeneration and restoration treatments – The Proposed Action would allow the creation of 796 acres of 0-10 year old forests over the 5-year implementation period. Very little silvicultural habitat management has taken place on Tuskegee NF recently. Habitats for early seral associates have virtually disappeared. This lack of early seral habitats may also begin to affect managers’ abilities to provide white-tailed deer, Eastern wild turkey, and northern bobwhite quail at levels sought by the public. After Proposed Action implementation, 7% of the forested acres on Tuskegee NF would exist as young (0-10 year old) forest. Forest Plan Restoration Prescriptions described desired conditions as having 10% to 17% of early successional forest. Dispersed Recreation prescriptions describe 4% to 10% of early successional forest as desirable conditions.

Thinning harvests, both commercial and pre-commercial – The Proposed Action would allow 377 acres of overstocked pine stands to be thinned. Thinnings would improve habitats for

northern bobwhite quail, white-tailed deer, and Eastern wild turkey. Habitats for prairie warblers would be marginally improved if thinned conditions are open enough and if prescribed fires are utilized to develop an herbaceous groundcover with sparse shrubs interspersed. Brown-headed nuthatches would be benefited by thinnings as residual trees would provide improved foraging conditions for them.

Mechanical site preparation and vegetation control – The effect of mechanical site preparation on MIS is merely to improve effectiveness of restoration efforts. Site preparation reduces hardwood coppice competition to planted pine seedlings.

Chemical site preparation and non-native invasive species control by chemical – Chemical site preparation effects to MIS are also limited to habitat effects. No chemical poisoning or contamination is expected to wildlife species when herbicides are used according to labeling. Herbicide treatment to hardwood competition to planted longleaf seedlings, reduces competition, improves longleaf habitat establishment, and prolongs early seral habitat conditions.

Prescribed fire use and vegetation control and management – The most important effect of prescribed fires on MIS is the beneficial effect of creating or maintaining native herbaceous groundcovers where open forest canopies allow adequate sunlight. The upland longleaf woodland ecosystem is ecologically important because of the large numbers of species that can utilize it. Frequent fires, including growing season fires, can allow early seral habitat niches to persist in mature stands. This effect is beneficial to prairie warbler, deer, turkey and quail.

Comparison of Alternative Effects - Harvest levels and types in Alternative 3 do not differ from the Proposed Action. The only difference in Alternative 3 is the preclusion of herbicide use. No herbicides would be used for site preparation or non-native invasive plant species control. If non-native invasive plant species controls are feasible and attempted, they will be by mechanical methods such as mowing, cutting, and root grubbing. Prescribed fire may also be used to control some non-native invasive species, where feasible. Exclusion of herbicide use may require more aggressive use of prescribed fire and/or mechanical methods to accomplish site preparation.

Alternative 4, proposes thinning only, to accomplish restoration of 450 acres within the longleaf pine ecosystem of the Tuskegee National Forest occurring over 2 years. Thinning treatments would be implemented in upland pine and pine hardwood stands containing 80 square feet of basal area per acre and higher. All of these stands were selected for treatment under the Proposed Action. Fewer acres and fewer proposed treatment stands are included in Alternative 4. No site preparation or non-native invasive species treatments would take place under Alternative 4. Residual basal area in thinned stands will vary from 40 to 60 square feet per acre. In stands with mature or relict longleaf and/or shortleaf trees; these trees will be left. Some natural regeneration of longleaf pine may occur within thinned stands if created gaps are large enough. Seed sources in treatment and adjacent stands may be adequate to allow natural regeneration of longleaf in isolated areas. Prescribed fire will be used to encourage “site preparation” for natural regeneration and to encourage the development of an herbaceous, pyrophytic native grass and herb groundcover. Herbicides will not be used in this Alternative 4.

Table 3.B.7.1-3: Comparison of Alternatives.

	Alt. 1 No Action	Alt. 2 Proposed Action	Alt. 3 No Herbicide	Alt. 4 Thinning Only
White-tailed deer	Capability to provide this species at levels equal to meeting hunting demand for this species decreases.	Capability to provide this species at levels equal to meeting hunting demand for this species increases.	Capability to provide this species at levels equal to meeting hunting demand for this species increases.	Capability to provide this species at levels equal to meeting hunting demand for this species increases.
Eastern wild turkey	Capability to provide this species at levels equal to meeting hunting demand for this species decreases.	Capability to provide this species at levels equal to meeting hunting demand for this species increases.	Capability to provide this species at levels equal to meeting hunting demand for this species increases.	Capability to provide this species at levels equal to meeting hunting demand for this species increases.
Northern bobwhite quail	Capability to provide this species at levels equal to meeting hunting demand for this species decreases.	Capability to provide this species at levels equal to meeting hunting demand for this species increases.	Capability to provide this species at levels equal to meeting hunting demand for this species increases.	Capability to provide this species at levels equal to meeting hunting demand for this species increases.
Brown-headed nuthatch	Unimpeded succession, in fire suppressed landscape reduces the pine and pine-oak forest community.	796 acres of long-term habitats established. 377 acres of thinned acres improved. Chemical, mechanical, and burning treatments improve habitat duration.	796 acres of long-term habitats established. 377 acres of thinned acres improved. Mechanical and burning treatments improve habitat duration.	377 acres of thinned acres improved. Burning treatments improve habitat duration.
Prairie Warbler	No early seral habitats created. Unimpeded succession reduces early successional forest communities and other early successional habitats.	796 acres of early seral habitat created. Thinnings produce additional benefit where herbaceous understories become established. Prescribed burning maintains early seral conditions for extended period.	796 acres of early seral habitat created. Thinnings produce additional benefit where herbaceous understories become established. Prescribed burning maintains early seral conditions for extended period.	No early seral habitat created. Thinnings (377 ac) produce additional benefit where herbaceous understories become established. Prescribed burning maintains early seral conditions for extended period.

Cumulative Effects

Cumulative effects of the Proposed Action and all of the action alternatives are negligible when all project mitigations are applied. Project mitigations are the Forest Plan standards. Restoration harvests, thinning harvests, chemical and mechanical site preparation, chemical non-native invasive species control, temporary access management, and prescribed burning, in addition to other Forest Service management programs for recreational uses of the forest, are mitigated, by Forest Plan design, through Forest Plan standards. No cumulative effects are expected as a result of the Proposed Actions, the action alternatives, or existing programs.

3.B.8 Rare Communities

Affected Environment

Rare communities are assemblages of plants and animals that occupy a small portion of the landscape, but contribute significantly to plant and animal diversity. Rare communities, wherever they occur on the Forest, are managed to ensure their contribution to meeting goals for community diversity, endangered and threatened species recovery, and species viability. These lands serve as core areas for conservation of the most significant elements of biological diversity identified to date on the Forest. The emphasis of designation and management of these areas are: (1) to perpetuate native communities that are rare (at the scale of their ecological Section or Subsection unit), and (2) to perpetuate or increase associated plant or animal species that are

federally listed as threatened or endangered, or are of viability concern. These areas are generally unsuitable for timber production.

Herbicides may be used in rare communities when:

- NNIS have overwhelmed the community
- Plants associated with a specific rare community are not present
- The use of other methods identified in the Nonnative Species section:
 - are uneconomical
 - have greater resource effects such as soil erosion
 - benefit or cause the NNIS to spread
 - when accessibility is problematic (no road to drive tractor & mower)

Some of the rare communities on the Tuskegee National Forest are:

Wetland Communities - Springs and Seeps

These rare communities are characterized by 1) soils that are semi-permanently to permanently saturated as a result of groundwater seepage, perched water tables, rainfall, or beaver activity, but otherwise are generally non-alluvial, and 2) presence of wetland-associated species such as sphagnum, ferns, and sedges. Dominant vegetation may be herbs, shrubs, trees, or some complex of the three. Ponds in this group include depression ponds, which may hold areas of shallow open water for significant portions of the year. Also included are all impoundments and associated wetlands resulting from beaver activity. Primary management needs are protection from non-target management disturbance and resource impacts, particularly to local hydrology. Periodic vegetation management may be necessary to maintain desired herbaceous and/or shrubby composition at some sites.

Alternative 1 (No Action)

Direct, Indirect and Cumulative Effects

Under the No Action alternative, current management plans would continue to guide management of the project area. No control measures for plant species invading this community would be implemented to accomplish project goals, and the plants would continue to spread, threatening native plant biodiversity and altering native communities.

Cumulative Effects

These are rare sites that are protected by prescription 9F of the RLRMP for the National Forests in Alabama. These communities are small and scattered across the landscape. Without management the quality and diversity of these communities will further decline and unknown locations of this rare community may be lost.

Alternative 2 (Proposed Action)

Wetland rare communities are managed under all alternatives under the 9F Rare Community

Prescription for protection, maintenance, and where possible, restoration. These wetlands generally fall within riparian corridors, so provisions of the Riparian Prescription also would apply. Standards under all alternatives provide for protection of hydrologic function of wetland rare communities.

Because wetland rare communities would be protected and maintained in all alternatives, no adverse direct or indirect effects to these communities are expected. However, analysis indicates that, under all alternatives, wetland rare communities would remain uncommon on the forest because of their naturally limited distribution.

Cumulative Effects

Because all alternatives place priority on protection and maintenance of these communities, cumulative effects are expected to be positive.

Alternative 3 (No Herbicide)

Direct, Indirect and Cumulative Effects

The effects under this alternative are the same as Proposed Action.

Alternative 4 (Thinning Only)

Direct, Indirect and Cumulative Effects

The effects under this alternative are the same as Proposed Action.

Forest Communities – Basic Mesic Forests

On coastal plain sites such as the Tuskegee National Forest, these communities are more typically found on north or east slopes, where dominant and characteristic overstory species are American beech (*Fagus grandifolia*) and northern red oak (*Quercus rubra*), with tulip poplar (*Liriodendron tulipifera*), white oak (*Quercus alba*), shagbark hickory (*Carya ovata*), or white ash (*Fraxinus americana*), with southern sugar maple, chalk maple, painted buckeye (*Aesculus sylvatica*), and pawpaw (*Asimina triloba*) in the midstory and shrub layers, and understories that include faded trillium, nodding trillium (*Trillium rugelii*), black cohosh, doll's eyes, foam flower (*Tiarella cordifolia* var. *collina*), bloodroot (*Sanguinaria canadensis*), bellworts (*Uvularia* spp.) and trout lilies (*Erythronium* spp.). Good examples of low elevation basic mesic forests have a low incidence of sweetgum (*Liquidambar styraciflua*), loblolly pine (*Pinus taeda*), and exotics such as Japanese honeysuckle (*Lonicera japonica*) or Chinese privet (*Ligustrum vulgare*). Basic mesic forest communities are found in both the Appalachian and Piedmont regions as well as in the Coastal Plain. Only prime examples of these communities, as identified in the forest-wide rare community database, are managed under the Rare Community Prescription. Provisions of the Rare Community Prescription apply only to prime examples of this community that support significant populations or associations of species of viability concern. Primary management needs are protection from non-target management disturbance.

Direct and Indirect Effects – All Alternatives

For the life of this EA none of the alternatives results in significant changes to the age structure of basic mesic forest habitats.

Cumulative Effects:

The cumulative effect on the quantity and distribution of mesic forest habitats are determined by considering trends in the status of these conditions through time and across private and public ownerships. The Tuskegee National Forest contains a relatively small proportion of known occurrences of this community type on a landscape scale. These habitats are not expected to change during the project implementation of this EA.

Xeric Sandhills

This community occurs in the East Gulf Coastal Plain, where it is restricted to extremely deep sandy soils. It is distinctive for its lack of wiregrass due to the extreme edaphic conditions. This sandhill association is widespread on Lakeland soils. Longleaf pine dominates the canopy, with 10-30% coverage. The understory of scrub oaks, mainly turkey oak (*Quercus laevis*), but also bluejack oak (*Quercus incana*), sand live oak (*Quercus geminata*) and sand post oak (*Quercus boyntonii*), is highly variable, from shrubs to small trees (depending on interval, season, and pattern of fire), and from very sparse to very dense. Hawthorn (*Crataegus lacrimata*) and gopher apple (*Licania michauxii*) are typically present as low shrubs. Little bluestem (*Schizachyrium scoparium*), three-awn grasses (*Aristida* spp.), and goat's rue (*Tephrosia* spp.), may be contained in the herbaceous stratum.

In the field, xeric sandhills can be distinguished from surrounding forests and woodlands by an increase in elevation, extremely deep sandy soils, low overstory density, and the small, shrubby, growth form of oak species in the area. Good examples of xeric sandhills have a low incidence of sweetgum (*Liquidambar styraciflua*), loblolly pine (*Pinus taeda*), and exotics such as Japanese honeysuckle (*Lonicera japonica*) or Chinese privet (*Ligustrum sinense*). Occurrences are typically small in size, ranging up to ten acres.

Alternative 1 (No Action)

Direct and Indirect Effects

Under the No Action alternative, current management plans would continue to guide management of the project area. No control measures for rare community improvement and protection would be implemented to accomplish project goals. Plants endemic to the sites may be reduced by the undesirable encroachment of non-native invasive species, threatening native plant biodiversity and altering the communities.

Cumulative Effects

As these are rare sites, they are protected by prescription 9F of the RLRMP for the National Forests in Alabama. These communities are small and scattered across the landscape. Without management the quality and diversity of these communities will further decline.

Alternative 2 (Proposed Action)

Restoration and maintenance activities that result in an open forest canopy such as prescribed burning (including dormant, frequent, and summer burning), thinning, and mid-story removal, directly affects the abundance of the sandhill community type. Some short-term negative direct effects are possible due to the seed or root bank of plants occurring in the stands at the time of project activities, and to those individuals overlooked in the project area at the time that activities are implemented. Activities may temporarily set back plant and animal reproduction or growth. All known populations of threatened, endangered, and sensitive species will be protected from management activities that are likely to adversely affect them. However, long term results are expected to be positive.

Herbicides will not be used within this community. Mechanical and/or hand tools will be used to control non-native invasive species.

Cumulative Effects

Planned levels of maintenance and restoration activities will influence the future abundance of xeric sandhill communities. The ability to meet the activity levels requiring thinning, burning and/or restoration methods will vary among the alternatives due to the differences in management intensity and emphasis. It is expected that continued protection and restoration of these communities, as emphasized in the rare community prescription will continue to ensure the presence and full functionality of this ecosystem.

Alternative 3 (No Herbicide)

Direct, Indirect and Cumulative Effects

The effects under this alternative are the same as Proposed Action.

Alternative 4 (Thinning Only)

The effects under this alternative are the same as Proposed Action.

Canebrakes

This community is characterized by almost monotypic stands of giant or switch cane (*Arundinaria gigantea*), usually with no or low densities of overstory tree canopy. It is typically found in bottomlands or stream terraces. This community is often within the riparian are, and therefore is also protected by Riparian Prescription Standards. Although cane is found

commonly as an understory component on these sites, provisions of the Rare Community Prescription apply only to larger patches (generally greater than 0.25 acres) exhibiting high densities that result in nearly monotypic conditions, or to areas selected for restoration of such conditions. This community is found in the Appalachian, Piedmont, and Coastal Plain regions. Primary management needs are restoration and maintenance through overstory reduction and periodic prescribed fire.

Alternative 1

Direct and Indirect Effects

Under the No Action alternative, current management plans would continue to guide management of the project area. No control measures for rare community improvement and protection would be implemented to accomplish project goals.

Cumulative Effects

These sites are protected by prescription 9F of the RLRMP for the National Forests in Alabama. These communities are small to medium sized and scattered across the landscape. Without management the quality and diversity of these communities will further decline.

Alternative 2 (Proposed Action)

Direct and Indirect Effects

Although cane is found commonly as an understory component in bottomlands and stream terraces, provisions of the Rare Community Prescription would apply only to larger patches exhibiting high densities that result in nearly monotypic conditions, or to areas selected for restoration of such conditions. In addition, the rare community prescription would be applied to these communities where there are less than five (5) known occurrences on the unit, they contain rare plant species or are in particularly good condition. All existing canebrake communities meeting this definition would be managed under all alternatives for protection and maintenance. Restoration objectives as defined for the Revised Forest Plan and would vary by alternative. Canebrakes generally fall within riparian corridors, and therefore, would also be subject to Riparian Prescription provisions.

By specifically directing restorative prescribed burns on a 2 to 8-year interval, impacts to the canebrake should be beneficial. Prescribed burning would be carried out following standards and guidelines for prescribed fire, including prohibition of fire-line construction in rare communities. Overstory and midstory removal, where needed for restoration, would be conducted under the standards and guidelines developed for rare communities, thus preventing direct adverse effects to the canebrakes during implementation of the vegetation removal.

Herbicides will not be used within this community. Mechanical and/or hand tools will be used to control non-native invasive species.

Cumulative Effects

Because priority is put on these communities, effects of national forest management on them and the associated species is expected to be beneficial under all alternatives. However, this community will remain rare relative to its historical distribution, making these habitats on national forest land critical to associated species.

Alternative 3 (No Herbicide)

Direct, Indirect and Cumulative Effects

The effects under this alternative are the same as Proposed Action.

Alternative 4 (Thinning Only)

Direct, Indirect and Cumulative Effects

The effects under this alternative are the same as Proposed Action.

Bartram Botanical Area

The Bartram Botanical Area, located on the Tuskegee National Forest, is an incredibly intact composite of riparian communities. Situated alongside and across the floodplain of the Choctawhatchee Creek, this area has been only lightly impacted by previous private-owner land management practices. The Bartram trail entering the botanical area runs alongside one of the few rock/boulder outcrops on the unit. This area contains several rare or unusual intact riparian communities, including a globally rare community of Spruce pine/Southern Magnolia/Cherrybark Oak/Needlepalm plant association. Forested canebrakes are present, as well as alluvial calcareous mesic bottomland forests (Pyne & Stewart, 1999). Several PETS and locally rare species of plants are only found in this area on the district.

Fire has played a part in the establishment of this system, as evidenced by the mosaic fingering down the steep mesic slopes, the presence of cane, and the burn marks at the bases of the hardwoods. These fires would generally have a low intensity and duration due to the nature of the fuels, except during times of extreme drought. However, the existing hydrological regime including periodic inundation and drainage from the uplands define the main portions of the Bartram Botanical Area. Alluvial pools provide insets, around which needlepalms (*Rhapidophyllum hystrix*) have become established. Single tree canopy gaps in the overstory allow for the reproduction of spruce pine and cane as well as other species (USFS surveys, 1999, 2000).

This area is particularly unique in character when the surrounding private lands are considered. Riparian floodplains containing these unique communities rarely exist on private lands, and where present, have been heavily impacted or are tiny (less than one acre) in size. The Bartram Botanical area may be one of the last strongholds of intact riparian corridors in that portion of the

upper gulf coastal plain. Conversion of similar sites on private lands has resulted in the loss of previously documented rare communities and rare plant sites (Kral, 2002).

Alternatives 1, 2, 3 and 4

Direct, Indirect and Cumulative Effects

Under the proposed action of this EA, there will be no effects in this community.

3.C Other Elements

3.C.1 Recreation

3C.1.1 Dispersed Recreation Use

Affected Environment

Dispersed recreation is defined as those activities that occur outside of developed recreation sites such as boating, hunting, fishing, hiking and biking. Every developed recreation site facilitates dispersed use of the forest, but some sites such as trailheads and boat ramps are constructed strictly to provide access for dispersed recreation use. Dispersed recreation prevails on the Tuskegee National Forest. There are 8 miles of mountain bike trails, 12 miles of hiking trails, 14 miles of horse trail. Hiking, hunting, mountain biking, camping, bird watching and horseback riding are the most popular. There are not any areas designated for off road vehicle use.

Camping on the Tuskegee National Forest is in the general forest area and restricted (during gun deer season) to primitive camp sites commonly referred to as Hunter Camps. Site rehabilitation is necessary at some of the Hunter Camps. Problems include soil exposure and substandard visual settings.

3.C.1.2 Developed Recreation Use

Affected Environment

A developed site is a discrete place containing a concentration of facilities and services used to provide recreation opportunities to the public and evidencing a significant investment in facilities and management under the direction of an administration unit in the National Forest System. Recreation sites are developed within different outdoor settings to facilitate desired recreational use. Developed recreation sites include such facilities as campgrounds, picnic areas, shooting ranges, swimming beaches, visitor centers and historic sites. There are 3 developed recreation areas on the Tuskegee National Forest; the Uchee Shooting Range, Taska (a picnic area w/vault toilet) and the Atasi Wildlife Viewing Area.

Developed recreation sites provide different levels of user comfort and convenience based on the assigned Recreational Opportunity Setting (ROS). Development Levels range from 1 to 5, with

Level 1 representing the most primitive, natural settings with minimal or no site amenities. Level 5 represents the highest level of development with fully accessible facilities.

Alternative 1 (No Action)

Direct and Indirect Effects for All Recreation Types

The no action alternative, if implemented, would affect the dispersed forms of recreation such as hunting, viewing wildlife and bird watching. Other types of dispersed recreation such as viewing natural vegetation, hiking or driving for pleasure may be affected. Poor habitat conditions, insect and disease outbreaks and poorly maintained roads will result in a degraded forest ecosystem, increased safety concerns to forest recreation users and employees.

The Uchee Shooting Range will only be closed during periodic maintenance and facility upgrades.

Alternative 2 (Proposed Action)

Direct and Indirect Effects for All Recreation Types

At times the recreation experience may be lessened by the noise and dust created by heavy equipment operating in the forest. Recreationists may see skidders, heavy trucks, and other equipment associated with commercial timber harvesting operations. In some instances, log landings and slash may be seen.

Trail users, may see where equipment has crossed a trail at a designated point. Areas that may have been shaded because of a closed canopy will be opened and have sunlight streaming in. In some instances, these visitors may see also slash and log landings.

Vehicle operators may encounter heavy equipment on forest roads. Dust may obscure temporarily the driver's vision. Other equipment may be seen working in the forest. Log landings and slash may be seen adjacent to roadsides.

Camping will be restricted in areas where commercial harvesting is occurring for the safety of the visitors. Campers may find some hunter camps have been relocated after project implementation.

Developed site visitors may experience some of the same effects described above. The Uchee Shooting Range would be closed while Alternative 2 is being implemented adjacent to this site. The site, however, will be protected. Most of these effects are temporary; however, the relocation of some Hunter camps may be necessary because of previous resource damage caused by heavy use or from resulting stand conditions from the implementation of the proposed action.

Implementation of the proposed action will provide interpretive opportunities for visitors to see a forest at work; restoring the ecological environment to a portion of its pre-European condition.

Herbicide use will cause a temporary browning of vegetation. The browning of the target vegetation typically allows other plants underneath to grow providing a greening up effect. Most herbicide application occurs during the growing season. Depending upon needs, some herbicide application may be accomplished during the late summer or fall so that browning of the vegetation occurs during the fall color transition.

Cumulative Effects

Participation in recreation activities will continue to increase on the Tuskegee National Forest. The increased demand will be seen in the amount of vehicles across the forest, increased requests for information from inside and outside the local commuting area. There will be increasing use of facilities such as trails, the shooting range and fishing ponds. Roads and facilities will show evidence of the increased use, requiring increased maintenance.

Users of the Uchee Shooting Range will experience some inconvenience while project implementation occurs adjacent to this site. The range will be temporarily closed for the safety of the public, forest service employees and other workers when they are present.

During the life of this EA, herbicides will be used on a small scale and may cause some user discomfort to visitors during their use of the Tuskegee National Forest due to the discoloration of targeted forest vegetation. Some sectors such as hunters and Special Use Permittees may welcome a less dense understory.

Alternative 3 (No Herbicide)

Indirect and Direct Effects

The effects of Alternative 3 are similar to those of Alternative 2. The primary difference is that herbicides will not be used. Visitors may not feel the same level of discomfort since the browning of vegetation will be from natural mortality or prescribed burning.

Cumulative Effects

The ability to thoroughly prepare sites for planting as needed and control of non-native invasive species will not occur, reducing the effectiveness of restoration efforts. Recreation areas and trails may become over grown from invasive species, reducing the value of the recreation experience on the forest.

Alternative 4 (Thinning Only)

Direct, Indirect and Cumulative Effects

Implementation of Alternative 4 will produce the similar effects as Alternative 3. There will not be any clearcuts with reserves and herbicides will not be used as part of the alternative.

Mitigation – Refer to Scenery Management Mitigation.

3.C.2 Scenery Management

Issues

Scenery, being the general appearance of place, is then the means by which recreation settings are described. Proposed activities in this EA will have both beneficial and adverse effects on scenery and thus recreational experiences. Some proposed treatments would diminish visual quality for short times. This may disperse or disappoint forest visitors and casual viewers. These same treatments may improve visitor's visual experiences in the long run by creating Open Park like stands of timber and increasing the opportunity to view wildlife.

Affected Environment

The affected environment includes the entire 11,255 acres of the Tuskegee National Forest and adjacent private land with views into the Forest.

The Tuskegee National Forest may be described by referring to descriptions of its physiographic section as described by Bailey and others. The Tuskegee is part of Southeastern Mixed Forest Province, Coastal Plain Middle Section. Distinctive, common, and undistinguished examples of the Coastal Plain Middle Section occur on this forest.

The forest is generally covered with an almost continuous canopy of soft to medium textured rounded tree forms, creating a natural-appearing landscape character. However, since the late 1990s, as a result of the Southern Pine Beetle infestation that killed large numbers of introduced and native pines, significant parts of the canopy have opened. Groups of tall, gray, defoliated stems, generally varying in size from less than an acre to major openings litter the area. Private land inside the proclamation boundary is mostly agriculture or forest.

Landscape character is described as the particular attributes, qualities, and traits of a landscape that give it an image and make it identifiable or unique. Landscape themes refer to the general focus or subject of variations on landscape character settings. They may be thought of as detailed descriptions of desired landscaper character. Themes range from a natural to an urban landscape. Tuskegee landscapes are predominantly Natural Appearing.

There is no designated wilderness included in the Tuskegee National Forest. There is, however, the approximately 187-acre Botanical Area. The ecological processes that made this area unique are enhanced by management activities. This means some parts of the area are natural evolving, but not all. There are no other natural evolving landscapes on the Tuskegee and The Botanical Area makes up less than 2% of the district. Rural-Forested is a very small category that includes places like Taska Recreation Area and Uchee Shooting Range.

Cultural features are present, often obvious, and represent the varied peoples who have lived and used the land now known as the Tuskegee National Forest. The Pleasant Hill Fire tower still exists on the Forest. Churches and cemeteries are found on the adjacent private lands. Many of these features on and off national forest have become special places requiring appropriate visual settings.

The scenic resources of the Tuskegee National Forest are managed in accordance with the Revised Land and Resource Management Plan and the publication Landscape Aesthetics, A Handbook for Scenery Management Agricultural Handbook Number 701 published 1995. Scenic Integrity Objectives (SIOs) are established by the Revised Land and Resource Management Plan.

Environmental Effects

Alternative 1 (No Action)

This alternative will not immediately affect visual resources. As time passes, natural processes or other management will change the visual character of the forest. The natural process changes are expected to be generally pleasing to most, provided no catastrophic insect, disease, or storm events occur. Even these potential occurrences would be acceptable to a portion of forest visitors. However, allowing overstocked stands of off-site species to continue is an invitation for insect or disease disasters. The loblolly stands in decline will continue to fail, and also, the chance to speed up the healing of beetle scared forests will be missed. This alternative does not provide direction for increasing longleaf and its associated fire dependent under story. The result of Alternative A is the lost opportunity to restore a scarce and visually appealing ecosystem.

Alternative 2 (Proposed Action)

Manipulating the environment in order to achieve the desired future conditions will certainly affect landscape character. The visual short-term effects from traditional logging and site preparation are expected to be negative; however, the long-term effects of this alternative are predicted to be positive. Replacing off-site loblolly pines with longleaf pines in their proper ecological place is expected to result in healthier, more diverse, and therefore, more visually pleasing forests. Diversity is the antidote for monotony. Restoring both southern pine beetle (SPB) openings and loblolly stands in decline to their appropriate ecological character will increase biological diversity quicker than waiting on natural processes.

The proposed commercial thinning activities are expected to provide little change in the scenic integrity of the landscape. Effects will be evident during logging and for a short time thereafter. The expected effects are the shrubs and herbaceous plants killed or damaged by the thinning operations. The proposed pre-commercial thinning is expected to have even less effects to the existing shrub and herbaceous under story due to the lack of a transportation component to this operation.

The restoration work includes herbicide site preparation. Herbicide application will result in standing dead stems, which will appear incongruent to the adjacent lands. The result of each of this activity will be negative to close viewers.

Prescribed fire will also be used as a site preparation tool. Wildfire is a natural process and prescribed fires are designed to mimic wildfires. Fire lines could result in negative visual effects if not properly sited and built. Prescribed burns are expected to cause, a blackened forest floor, scorched bark on some trees, and smoke and ash during actual burning. However, the evidence

of these perceived negative effects will not last long and color contrast caused by winter burns is minimal. Green-up will occur the following spring, and fire is a major tool in obtaining the desirable open park-like forest.

The visual effects near the Horse and Horse Trails is of consequence even with mitigation measures. Visitors are expected to find restoration operations visually negative during and immediately after the work. Ultimately, the area will be better off visually after logging evidence disappears provided one accepts the premise that on-site longleaf is preferable to off-site loblolly.

In areas that are assigned a SIO of moderate and are scheduled to be thinned, this alternative is expected to meet the objective provided the listed mitigation practices are accomplished. Full compliance with the existing line, color, and texture in these moderate SIO areas are expected within one year from the thinning activities.

In areas that are assigned a SIO of moderate and are scheduled to be restored, this alternative is expected to meet the objective provided the listed mitigation practices are accomplished. Full compliance with the existing line, color, and texture in these areas is expected within one year from the logging activity.

In areas that are assigned a SIO of high and are scheduled to be thinned, this alternative is expected to meet the objective provided the listed mitigation practices are accomplished. Full compliance with the existing line, color, and texture in these areas is expected almost immediately after the thinning activities occur.

In areas that are assigned a SIO of high and are scheduled to be restored, this alternative is expected to meet the objective provided the listed extremely arduous mitigation practices are accomplished. Full compliance with the existing line, color, and texture in the retention areas are expected almost immediately after the logging is completed.

Alternative 2 is expected easily to best the no action alternative because better ecosystems are expected to make better pictures.

Alternative 3 (No Herbicides)

Alternative 3 will have the visual effects described in Alternative B with the following difference. Herbicides will not be used. Mechanical site preparation will result in a disturbed forest floor in the restoration areas. But, there will be no dead stems created by herbicide application. Since the proposed number of treatment acres is the same as Alternative B the only visual variation in this alternative is this non use of herbicides. Some are expected to find this beneficial. Those who oppose the use of herbicides in National Forests are expected to detest any visual evidence of herbicide use, and they will not see that evidence under this alternative. However, those who accept the use of herbicides are expected to find this alternative less visually pleasing because of the disturbance created on the forest floor from mechanical site preparation. This is of particular concern on the Tuskegee because much of the forest includes soils particularly subject to erosion.

Alternative 3 is expected easily to best the no action alternative in regards to scenery because better ecosystems are expected to make better pictures.

Alternative 4 (Thinning Only)

Alternative 4 involves thinning only. The restoration treatments proposed in Alternative 2 will not occur in this alternative. This alternative will result in the least immediate visual affects in comparison to the other action alternatives. This alternative is expected to have negligible to minor effects on the existing scenic integrity. However, this alternative does lack the restoration opportunities afforded by the proposed action and Alternative 3. That means the ecological progress proposed in Alternatives 2 and 3 will be greatly inhibited. Therefore, under this alternative, the long-term viewer will be denied the opportunity to observe better ecosystems as expected in Alternatives 2 and 3.

Table 3.C.2-1: Affected Acres with an SIO of High or Moderate by Alternative

SIO Level	1-No Action	2-Proposed Action	3-No Herbicide	4-Thin Only
SIO High Restoration Treatment	0	26.1	26.1	0
SIO Moderate Restoration Treatment	0	308.9	308.9	0
SIO High Thinning Treatment	0	24.2	24.2	41.5
SIO Moderate Thinning Treatment	0	128.4	128.4	190.8

Mitigation Measures

Mitigation for Activity in the High SIO Areas along the Bartram Trail:

- Comply with Forest wide Standard FW-135.
- Comply with Forest wide Standard FW-136.
- Comply with Forest wide Standard FW-137.

Mitigation for Activity in the High SIO Areas along Interstate 85:

- Leave a 100 feet buffer of under story plants along the Interstate.
- Leave a 150 feet buffer of a continuous canopy of trees plants along the Interstate (this canopy may include non desirable species).
- Remove or cut the slash to lay within two feet of the ground in the 100 feet buffer zone for both thinning and restoration operations (this includes dead stems from herbicide application).

- Keep logging activity to a minimum to best accomplish the DFC.
- Locate landings and access roads out of the High SIO Area and far enough away from roads, trails, or built facilities to be screened by existing vegetation.
- Leave dogwoods and showy mast understory in restoration-cuts whenever reasonable.

Mitigation for Activity in the Moderate SIO Areas along Roads and Horse Trails:

- Leave a 75 feet buffer of understory plants along the roads and trails.
- Remove or cut the slash in the 75 feet buffer zone to lie within two feet of the ground.
- Skid trees away from the road towards the interior of the stand.
- Keep logging activity in the 75 feet buffer zone to a minimum necessary to best accomplish the DFC.
- Locate landings far enough away from the road to be screened by existing vegetation.
- Locate access road intersections to the landings perpendicular or nearly perpendicular to the road.
- Leave dogwoods and showy mast understory in restoration-cuts whenever reasonable.

Mitigation for Activity in the Moderate SIO Areas in Restoration Zones away from roads and trails (Compartment 8):

- Restoration activity in partial retention areas will require cuts of size and density, which will retain a natural appearing landscape within a year after logging operations, have ceased. Restoration cuts should be no larger than large wildlife openings.

Mitigation for Areas Affected by Prescribed Fire:

- After the burning is completed all plowed fire lines bisecting roads need to be reclaimed for a distance of 25 feet from the edge of the road.
- After the burning is completed all plowed fire lines bisecting trails need to be reclaimed for a distance of 25 feet from the edge of the trail.
- All plowed fire lines should intersect with roads at approximately 90 degrees.
- Located bladed or plowed fire lines along private land boundaries, existing roads, or streams when feasible. Keep interior fire lines to a minimum.

Mitigation for Activity in Low SIO Zones:

- Remove or cut slash in a 30 feet buffer zone along permanently open roads.
- Leave dogwoods and showy mast under story in restoration-cuts whenever reasonable.

Cumulative effects

The area analyzed for cumulative visual effects is the Tuskegee National Forest as described in the Affected Environment part of this section.

The landscape character of the areas proposed for each action alternative is natural appearing. Thinning will result in natural appearing land staying natural appearing, of course, with fewer

trees. Restoration work will create additional acres of longleaf landscapes and will speed the change to a more healthy forest. Allowing natural processes to create the healing is expected to take much longer.

All the action alternatives are designed to improve the ecological health of the Tuskegee National Forest; therefore, all the action alternatives should ultimately result in better visual settings. However, negative visual effects should be expected during and after the proposed activities. Also, visual healing in the restoration areas could take several seasons for almost all to be satisfied with the result.

All the action alternatives have negative short-term effects on recreation settings. These effects, on their own, should have only minimal impact on the recreational experience. However, when lumped with other visual effects such as litter, clear cutting on private land, or deferred maintenance at recreational facilities, the visual setting could move from acceptable to unacceptable for particular visitors.

This project is not expected to change the landscape character of the Tuskegee National Forest.

Monitoring

Forest Landscape Architect will approve, review, and report on all vegetative management activities before, during, and after their occurrence in or near the Bartram Trail.

Forest Landscape Architect will approve, review, and report on a typical restoration activity before, during, and after their occurrence along a road, horse trail, or bike trail with an SIO of High.

Forest Landscape Architect will approve, review, and report on a typical restoration activity before, during, and after their occurrence along a road, horse trail, or bike trail with an SIO of Moderate.

Forest Landscape Architect will approve, review, and report on a typical thinning activity before, during, and after their occurrence along a road, horse trail, or bike trail with an SIO of High.

Forest Landscape Architect will approve, review, and report on a typical thinning activity before, during, and after their occurrence along a road, horse trail, or bike trail with an SIO of Moderate.

3.C.3 Transportation System and Access

3.C.3.1 Roads

Affected Environment

Access to stands designated in this project is adequate with one exception (see Right-of Ways). No new roads will be constructed. Existing closed, seasonally closed, permanently open roads as listed in Table 2.7.2.1-1, and old woods roads will be used for the implementation of this project.

Road distances are approximated. A road analysis plan is located in the project file.

Table 3.C.3-1: Roads Data for Project Implementation

Road #	Forest Service	Public	Closure Status	Miles Open	Miles Closed
900	X		O	3.5	
902	X		SC		.8
904	X		O	1	
906	X		SC		2
906	X		O	1	
906A	X		C		1
906E	X		C		.5
906F	X		C		.5
910	X		O	2.5	
910C	X		O	.5	
911	X		O	.1	
913	X		O	2	
920B	X		C		.5
930	X		PC	.2	.3
54		MC	NA	3	
89		MC	NA	1	
90		MC	NA	1.5	
29		US	NA	7	
91		MC	NA	2.5	
53		MC	NA	2	
186		S	NA	4.5	

Key to table – Jurisdiction: X = FS, S = State, MC = County; Closure Status: O = Open, C = Closed, PC = Closed Portion(s), SC = Seasonal Closure, US = Federal

Old woods roads have a road bed that is essentially in place. They will be cleared for reuse. Closed roads will be opened, rehabilitated and re-closed. Temporary roads and skid trails will be created to remove timber as needed. Maintenance activities such as gravelling, daylighting, brushing and grading will be required on some roads to accommodate equipment. Skid trails, temporary roads and selected closed roads will be waterbarred, seeded or reseeded with native grasses and or wildlife food mixtures to create temporary and permanent wildlife openings.

Transportation facilities are essential in providing access to and through the Forest. Access is provided for Forest administration, visitor recreation and for transporting forest products where applicable. An easement is needed to access Stand 9, in Compartment 5. This access is needed because a large ephemeral stream prevents access to the stand on the southwest corner of Forest Service property and because of a 40 acre inholding.

Most roads on the Forest were constructed for commodity needs such as timber production; mining and special use access, and range management. Although access is still needed for these purposes, access for recreational purposes is now the highest use of roads.

The Tuskegee National Forest consistently faces road and access issues which directly or indirectly affect the existing natural resources. Evidence of resource damage attests to unauthorized off-road travel by motorized vehicles in some areas. These violations occur

yearlong, but peak during the fall hunting season. Resource damage is especially critical if it occurs in watersheds, highly erosive soil or areas containing threatened or endangered communities of plants and animals. Vandalism and destruction of signs, ditches and barricades is also a problem in some areas of the Forest.

Forest Service road density within the Tuskegee Nation Forest is one (1) mile of road for every 281 acres of forest. Total road density, including all public roads is 1 mile for every 126 acres of forest.

As a result of decreased and inadequate funding, the condition of many roads on the Forest are at minimum levels necessary for safety, for resource protection and to efficiently support the traffic volumes being carried. Because of fewer commercial activities like timber sales, maintenance funding has also decreased from user contributions. Trends indicate that traffic volumes will continue to increase in the future, especially from recreation-oriented traffic.

Alternative 1 (No Action)

Direct and Indirect Effects

Under the no action alternative, forest roads will continue to be used at an increasing rate. The need for road maintenance will continue to increase. Insufficient funding will be available only to maintain a small percentage of the forests' roads. Road conditions will continue to deteriorate.

Cumulative Effects

If forest roads can not be properly maintained to meet increased traffic levels, damage to forest resources may result. Some currently open roads may have to have be seasonally closed or closed permanently to all traffic except for administrative use only.

Alternative 2 (Proposed Action)

Direct and Indirect Effects

On the Tuskegee National Forest, the existing road system appears be adequate. The need for road reconstruction may be needed where existing roads were not adequately maintained, due to insufficient funding. The construction and use of temporary roads will be needed to access some commercial timber sales being used as a tool to achieve restoration to correct forest types.

Road damage most often occurs in the spring from recreational driving and in the fall from hunting activities, when wet weather conditions often saturate road surfaces. Commercial timber sales will augment the forests' road budget and provide funding for additional maintenance thereby improving safety, user comfort and bring designated roads up to standards.

Improved roads will also cause an increase in traffic volume through out the year. Visitors will have to use increased vigilance during harvesting activities as heavy equipment will be utilizing many of the same roads.

Cumulative Effects

The use of National Forest System roads will increase as populations grow and urban development expands near the Forest. Arterial and major collector roads that connect to the Forest are expected to experience the most increased day-use traffic, particularly on weekends and holidays. As the population demand for public land use increases, the use of forest collector and local roads is expected to increase, particularly in the fall and spring seasons of the year. This additional traffic during the wet and freeze/thaw portions of the year will require additional road maintenance work to provide a safe and useable road system.

Alternatives 3 and 4

Direct, Indirect and Cumulative Effects

Implementation of the Alternative 3 or 4 will have the same effects to the transportation system as the Proposed Alternative.

3.C.4 Prescribed Fire

Affected Environment

The presence of fire begins long before humans arrived in North America. Fire has no doubt been a major selection force in our forest ecosystems, both lightning and human-caused. This great and persistent selecting force has influenced ecosystem traits and characteristics since fuels and lightning first interacted. Fire is a natural ecological process, but unlike many other natural events (tornadoes, floods, hurricanes), man has the capability to use fire as a tool and, as recent history has shown, to suppress the natural processes of fire. When fire is used as a tool within the fire adapted ecosystem, the result is a forest with diversity and flexibility that is well adapted to fire occurrence. Many communities and species require fire to sustain populations. Oak and southern yellow pine communities have been major components of these forests for thousands of years. These communities promote and require fire. Reoccurring fire has been a part of the ecosystem for thousands of years. Burning is the oldest sustained land management force on these forests. No other practice can be said to have such a track record with known results.

Fires generally fall into one of two categories - wildland fires or prescribed burns. A wildland fire is a fire resulting from an unplanned ignition; it requires an appropriate management response to control its spread. A prescribed fire is any fire ignited by management actions to meet specific objectives.

Prescribed fire and mechanical fuels treatments are designed to reduce the risk of catastrophic wildfires by decreasing the amount of available fuel that the fire is able to consume and thus carry the fire. Both methods are utilized to restore fire regimes within or near the historical range.

Prescribed fire is a major tool in ecosystem restoration efforts. Prior to landscape fragmentation brought by human habitation, fire was a frequent, natural occurrence across much of the

Southeast and maintained once-extensive longleaf pine and grass communities (Christensen 1981). Dead needles and grass furnished fuel that carried fire and maintained healthy stands (Landers 1991). Without fire, plant community composition and structure changed. Woody species increased, and grasses and forbs declined (Lewis and Harshbarger 1976, Myers 1985). Fire is also known to control brown-spot needle blight (*Scirrhia acicolu*), which can severely limit the growth and survival of longleaf seedlings (Boyer 1975). Burning encourages the production of flowers and seeds by native grasses and forbs (Christensen 1981, Platt et al. 1988, Clewell 1989, Outcalt 1994). It is therefore necessary that resource managers, conservation groups, and others promote the use of fire to maintain longleaf community health (Landers et al. 1995), (Outcalt 2000).

Prescribed fire, despite concerns about its use, remains an important and ecologically appropriate management tool. Natural fuels must be managed over time to meet long-term resource management objectives. The EPA states in their 1998 policy document entitled “Interim Air Quality Policy on Wildland and Prescribed Fires”, that while future air quality concerns from prescribed fire may arise, the EPA is on record as stating that fire should function as nearly as possible in its natural role in maintaining healthy wildland ecosystems and protecting human health and welfare by mitigating the impacts of air pollutant emissions on air quality and visibility.

Condition classes are a function of the departure from historical fire regimes, resulting in alterations of key ecosystem components such as species composition, stand structure, successional stage, stand age, and canopy closure. One or more of the following activities may have caused this departure: fire exclusion, timber harvesting, grazing, introduction and establishment of exotic plant species, insects and disease (introduced or native), or other past management activities. The Tuskegee National Forest is a Fuel Model 13 (Anderson, General Technical Report INT-122, 1982) and a Fire Condition Class 3. Fire condition classes are found and explained on pages 3-474 and 3-475 of the FEIS for the RLRMP for the National Forests in Alabama.

There will be evidence of frequent, low-intensity fires. Tree trunks will be blackened. Residual smoke from prescribed fires may be present. The evidence of firelines will be rarely seen. The imprint of a narrow access road covered in grass would be common.

Alternatives, 1, 2, and 4

Direct and Indirect Effects

The use of prescribed fire will continue a part of the standard land management practices on the Tuskegee National Forest. Prescribed fire, sometimes referred to as “burning”, “prescribed burning” or “controlled burning” is used to reduce fuel loads within the forest to reduce the risk of wildfire. It is also used to improve wildlife habitat and rare community conditions.

Prescribed burning typically produces a mosaic effect within the forest. There are patches of burned and unburned vegetation. The topmost portion of litter on the forest floor is burned. The

more decomposed and damp duff remains, protecting the soil. The ash contains nutrients that are made available for plant uptake.

Interior forest roads, trails and recreation areas may be closed to forest visitors in the immediate vicinity during the burn as a safety precaution. Other roads may have smoky or hazy conditions, limiting visibility. Smoke produced during the burns may cause discomfort to smell it.

Burned areas may not be aesthetically pleasing initially. Because fuels are not uniformly distributed, some trees may have blackened trunks and some tree foliage may be turn red or brown and fall off. Visibility where the burns are occurring may be reduced. After the burn is completed, visitors may smell remnant smoke. There may be residual smoke from burning stumps and downed logs within the burns' interior.

All of these effects are temporary. Vegetation on the forest floor quickly regrows, softening the appearance of the burned area. Smoke quickly dissipates. Smoke from stumps and logs stops when they are consumed or when the fuel's moisture content becomes too high and extinguishes the fire. The young vegetation is succulent and attracts grazing animals such as deer.

Fire hazard can be related to stand age, stand structure, stand composition, insect infestations such as SPB, weather conditions or events and stand density. Fire hazards are greatest in stands where an accumulation of ground fuels and vertical ladder fuels have occurred.

The timber and prescribed fire programs on the forest will have the most significant impact on the fire program in the future. Since the fire hazard is greatest in those stands that have greater accumulations of ground fuels and vertical fuels, the more timber that is removed from those stands should result in lower fire intensity and final fire size, should a fire occur under normal circumstances.

High value areas on the forest to be protected are key in the fuel/fire situation are urban interface areas, unique habitats or features, high value timber, and popular attractions, are a few examples.

The road management program has been declining over the past several years, and while any road reconstruction that provides access to the public might increase the possibility of human-caused ignitions, it also provides our firefighting resources with access as well.

Prescribed fire when used as the only site preparation tool, it may not be completely effective in preparing the site for planting. Dormant shrubs, small trees (up to 4 inches) and some non-native invasive species are not affected when only fire is used. They will typically re-leaf or sprout the next growing season, shading newly planted seedlings. Dense clumps may also remain creating difficult or impossible planting conditions.

Cumulative Effects

With the prescribed fire program staying close to the current annual acreages or increasing above current levels, fuel loads should not increase, but should tend to stabilize or decrease over time,

resulting in a reduced risk of large fires. This also reduces the probability of fires originating on federal lands spreading onto private lands before being controlled.

Current fuel loading on the Tuskegee National Forest favors prescribed burning during the dormant season to reduce fire intensity which reduces the risk of damage to forest resources. Growing season burns favors grasses. Dormant season burns favor woody plants. As these fuel loads continue to decrease, more growing season burns will be conducted.

The risk of ignition from lightning fires will remain constant while the risk of human-caused fires is expected to increase, due to the increased pressure by recreationists.

In an alternative with less motorized access to the forest, the risk of large fires increases due to the increase in travel time of firefighting resources, as well as longer initial reporting time. More development in the urban interface adjacent to the forest boundary will require an increased emphasis being placed on reducing hazardous fuels in those areas.

Alternative 3 (No Herbicide)

Cumulative Effects

Not having thoroughly prepared planting sites, new stands may not have enough longleaf seedlings planted to be adequately stocked. Adequate initial stocking insures that there are enough trees to cover natural mortality and as well as some poorly planted seedlings.

3.C.5 Heritage Resources

A Brief Cultural Resources Overview of the Tuskegee National Forest

The Tuskegee National Forest is located within the upper reaches of the East Gulf Coastal Plain Physiographic Region. The topography ranges in elevation from 260 feet above sea level along the western end of Choctafaula Creek to 520 feet above sea level along the ridges in the eastern side of the forest. Soils in the forest belong to the Dothan-Fuquay-Wagram and the Troup-Luverne-Dothan-Orangeburg Associations (USDA – Soil Conservation Service 1974).

According to David W. Chase, the Tuskegee National Forest is located in the area that was once the middle of the “Upper Creek Nation” during the 18th and early 19th centuries (Chase 1983:5). Previous archeological investigations conducted in the area have shown evidence of human presence for several thousand years (Chase 1983:6).

Approximately 80% of the Tuskegee National Forest has been surveyed for archeological sites. During the early 1980’s, surveys conducted by David Chase focused on the lower terraces along Choctafaula Creek and its tributaries. Chase recorded Archaic Period and Woodland Period prehistoric lithic scatters and campsites along the creek bottoms and early historic Creek Indian sites. Chase’s focus on the lower terraces resulted in no upland sites and no non-aboriginal historic sites recorded on the Tuskegee National Forest during these early surveys.

Historic research into the Tuskegee Land Utilization Project has shown that the upland

environment of the Tuskegee National Forest has undergone severe erosion control and land reclamation activities. Entire slopes have been terraced by heavy machinery since the late 1930's in order to control erosion. The research has also shown that at the time of federal acquisition, the land that is now the Tuskegee National Forest contained several hundred structures, consisting of dwellings, churches, and schools. These structures were recorded in the 1937 Macon County soil survey and in the acquisition records of the Tuskegee Land Use Project.

Since July of 1991, surveys conducted in the upland situations have located traces of these historic house sites. In most cases, the archeological remains have been scant, consisting of fieldstone piles and limited artifacts. Local informants, some of whom worked for the Tuskegee Land Utilization Project, have stated that the existing structures on the project area were either relocated with the occupants, relocated to be occupied by project employees, or were destroyed. As a result, the historic house sites on the Tuskegee National Forest were very light in their artifact density, and in most cases, the site area had been bulldozed.

Heritage Resources Management Inventory

The Forest Archeologist has reviewed the proposed project areas. The review consisted of:

- Review of Forest Service Files
- Review of Forest Archeologist Site Files and Status Atlas
- Examination of topographic and soil maps
- Examination of the 1937 Macon County Soil Survey Map
- Examination of the 1937 Macon County Highway Map
- Examination of Forest Service Land Acquisition Records
- Examination of Records of the Tuskegee Land Use Project
- Examination of the National Register of Historic Places

A list of stand survey status is located in the project file.

Direct and Indirect Effects (All Alternatives)

Prior to decision making for planned land management undertakings on the National Forests in Alabama, heritage resource inventories of the proposed Area of Potential Effect (APE) are conducted, and consultation with the Alabama State Historic Preservation Office (SHPO) are conducted. If any heritage resources are identified as being eligible for the National Register of Historic Places, protective or mitigative measures are developed through consultation with the Alabama SHPO. The Tuskegee National Forest will include these protective or mitigative measures in their project plan.

The discussion of direct, indirect, or cumulative effect is based on the assumption that although the required inventories have been conducted, including field survey, some smaller heritage sites or light artifact density sites may have been missed, and may be revealed during or subsequent to the project implementation. The amount of cumulative effects to known heritage sites considered eligible for the National Register of Historic Places from all management activities should be slight as inventory, assessment, protection and mitigation measures would be implemented prior to the initiation of the land management activities.

In addition to potential effect from land management activities, there is also potential effect from natural activities such as erosion, natural weathering, and wildfire. These natural occurrences could contribute to heritage resource deterioration through time. Cumulative effects from illegal artifact hunting and archeological vandalism occur on certain types of sites, primarily bluff shelters. Law enforcement may stem some of the activity if the perpetrators are apprehended and prosecuted. Public education as to the intrinsic values of heritage resources is also needed.

Prior to 1975, no heritage resource inventories existed. No records pertinent to the potential resource database were maintained. Therefore, the cumulative effects of Forest-related projects occurring on that resource base prior to the mid 1970's must be added to current measured effects. When compared to private lands, cumulative effects on the Tuskegee National Forest land are comparatively fewer. This is due to little or no resource base inventory is systematically conducted on private lands, and because currently, protective or mitigative measures are rare unless federally funded projects are being planned on these private lands.

Direct effects could result from both natural and human-caused events, such as:

- Soil disturbance to varying depths
- Burning
- Soil Compaction or rutting
- Alteration of a site's setting (example- intrusive visual or auditory components)
- Diminished jurisdiction, as in the case of land exchange out of federal ownership

Indirect effects may include vandalism due to increase access, or erosion or siltation from an off-site project.

3.D Social and Economic Analysis

3.D.1 Community Resources

Affected Environment

Macon County is located in what is known as the Black Belt. It is a geographical area known for its black, rich soil. The county is also predominately African American. It is economically depressed although not as poor as some other counties in the region. Like many counties in the Black Belt, this is an economically and medically disadvantaged area. The entire Tuskegee National Forest lies within the northeast central portion of the county.

Approximately 76% of the population does not have a college degree. There has been 3% decline in the population between 1990 and 2000. In the intervening years since 1950, Macon County has experienced a net population loss of 21%. The poverty level for county residents when measured against Alabama's 67 counties, ranks Macon 34th, giving the county a 27.6% poverty rate.

Current Economic Resources

Macon County has 4 primary communities; Tuskegee (County Seat), Franklin, Shorter and Notasulga. The areas's largest employers are the Veterans Administration (1300 employees) and Tuskegee University (1000 employees). Most other residents work in the nearby Alabama

communities of Montgomery, Opelika /Auburn, and Columbus GA. Land use in the county is primarily forestry and farming.

Table 3.D.1-1 contains some of the demographic data for Macon County, Alabama.

Table 3.D.1-1: Selected 2000 Census Data for Macon County

Total Area	613 sq miles
Population	24,105
Population Density	40 people/sq. mile
Major Ethnic Groups	
Black/African American	85%
White	14%
Asian	.38%
Median Household income	\$ 21,180
Median Family Income	\$ 28,511

Historically, the periodic harvesting of timber from the Tuskegee National Forest has generated profits, much of which has been returned to Macon County to help fund county roads and school systems and the US Treasury. Commercial timber sales and harvesting activities are a substantial benefit to the local economy because they provide numerous primary jobs for foresters, forestry technicians, loggers, equipment operators, truck drivers and many others associated with the procurement and production of timber from Forest Service timber sales. Secondary jobs are provided to the employees of timber processing and merchandising facilities and their associated wholesale and retail outlets, in addition to many others, such as logging equipment dealers and their employees (primarily salesmen and mechanics), and those that provide the tires, fuel, filters, lubricants and other supplies that keep the log trucks and other heavy equipment going. Timber harvesting has positive and far-reaching direct and indirect economic benefits as the money generated turns over several times in the local economy.

In addition, funds can be returned to the Forest from which they are collected for reforestation, watershed improvement, and a variety of wildlife projects. Much of the needed prescribed burning and other habitat improvement accomplished in the past on the Tuskegee National Forest was a result of returned timber receipts. This also helps to provide jobs to local citizens by way of direct employment by the Forest Service, contract work, and purchase of supplies, including seed and fertilizer, gas and oil for vehicles, etc.

Individuals may purchase permits that allow them to remove dead and down trees from the project area to be used in their homes as firewood. These permittees can expect to reasonably lower their expenses for firewood and overall home heating costs. Firewood cutters also provide some economic benefits to those who sell, service, and provide the gas, oil, filters and other supplies needed by those using chainsaws to cut firewood. Some revenue should also be realized by those businesses that provide the vehicles, vehicle maintenance, and supplies associated with hauling firewood from the woods to people's homes.

Dispersed recreation activities in the form of hunting, mountain biking, horseback riding and bird watching are popular on the Tuskegee National Forest. Thinning, longleaf restoration and

subsequent burning is an effective means of habitat manipulation that helps game species, which in return facilitates the recreational activities that depend on healthy populations of these animals. These activities provide a considerable economic return to the local economy where they occur. Economic benefits are realized in the increased sale of sporting goods and equipment, as well as in the form of food and lodging establishments, gas, service stations, etc.

The Tuskegee National Forest has a recent (through 2001) history of providing service values through thinning, restoring off-site stands to native longleaf, and prescribed burning. The forest was acquired in the 1930's in a severely degraded and cutover condition. The first goal was to re-establish the understory and overstory to keep erosion to a minimum. The desired future condition now is to continue to move toward a recovered ecosystem of longleaf pine on sites best suited for this ecosystem. Given the relative young age of this forest, an option to attain this goal is by regular thinning to keep the overstory healthy and growing and burning to maintain the understory. There are several ways to maintain the overstory. One is to let nature take its course and thin the forest through natural means such as wind throw or lightning strikes. We feel a better option is to thin regularly via commercial timber sales. We have an obligation to U.S. citizens to economical stewardship. Commercial timber sales are but a tool to doing this.

The ecosystem on the Tuskegee National Forest was originally shaped by and evolved with frequent fires. These fires burned until they were extinguished by rainfall or burned into a creek or stream. Even though the Tuskegee National Forest is more than 95% consolidated ownership, our neighbors will not tolerate insects ravaging onto their private lands or wildfires burning from Forest Service their property. Thus, to meet the desired future condition of the forest, we must maintain the understory in a controlled fashion by carefully planned prescribed burns.

There is a cost to doing all of this work. Regulations and good sense dictate that timber sales be administered to assure the government gets full value for the timber while maintaining the integrity of the sites. We have found that these two items are not mutually exclusive. We have demonstrated that we can maintain the integrity of sites while realizing full economic value for the products. The timber products we offer for sale are some of the finest in the South and we simply command top value for them. We bring a portion of these dollars back to the sale area for a variety of reforestation and wildlife improvement projects including the needed burning.

Environmental Effects on Economic Resources

Timber harvesting is a major factor influencing economics in the project area. The economic effects associated with timber harvesting activities as proposed in each alternative are displayed in Table 3.D.1-2. This table shows net income derived and associated costs of doing reforestation work caused by the timber activity. It does not take into account costs associated with prescribed burning or management of threatened and endangered species habitats as it is assumed that these activities would occur regardless of the timber sale activity, but at a lower rate. In addition, hunting of various game animals is a major sport in the project area and thus, plays a vital economic role in the community through purchases of hunting licenses, hunting supplies (weapons, ammunition, clothing, etc.), fuel, food, and lodging.

Table 3.D.1-2: Comparison of Environmental Effects on Economic Resources

Items	Units	Alt. 1 No Action	Alt. 2 Proposed Action	Alt. 3 No Herbicide	Alt. 4 Thinning Only
Estimated Timber Volume					
CCF - Sawtimber	100 Cubic Feet	0	17,034	17,034	1,997
CCF – Short Round Wood	100 Cubic Feet	0	5,748	5,748	3,135
Timber Value	\$	0	\$1,453,000	\$1,453,000	\$204,000
Reforestation Costs	\$	0	\$505,000	\$505,000	0
NFF Requirements (.25%)	\$	0	\$363,300	\$363,300	\$51,000
10% Roads and Trails	\$	0	\$145,300	\$145,300	\$20,400
Net Remaining	\$	0	\$439,400	\$439,400	\$132,600
<i>Notes: Timber values and volumes are estimated and may increase or decrease at sale time. Timber value estimated on FY 2004, third quarter base price for Non-salvage timber. All values are for comparison purposes only and are subject to uncontrollable events such as market price fluctuations, market demand, weather, labor costs, equipment and logging costs.</i>					

Alternative 1 (No Action)

The no action alternative would have negative economic effects. Revenue would not be generated in the areas of logging, manufacturing, and the wholesale and retail sale of forest products. If this trend were to continue in other projects, a cumulative effect would be that the timber industry would have to procure more raw wood products and retailers more finished wood products from outside sources in order to meet market demands. Shorter supplies of raw materials would tend to drive prices of both raw materials and finished wood products up. There would be no returns of money to the U.S. Treasury from the sale of timber, nor any addition to the forest road and trail funds.

Alternative 2 (Proposed Action)

The amount of timber products predicted to come from timber harvesting activities is listed in Table 3.D.1-2. The primary direct effect of timber management is production of wood products that help to maintain a thrifty economy. Revenue is generated for local economies through production of raw products and when manufactured and re-sold as finished products. Jobs and revenue are generated from the production of fence posts, pulpwood, barn poles, "chip and saw" logs, utility poles and pilings, sawlogs, and veneer logs from Forest Service land. The economy is also enhanced by the many jobs and large amounts of money stemming from the manufacture of these raw materials into finished products, and the sales of these finished products at wholesale outlets and retail stores. The total effect on the economy and the amount of money returned to the U.S. Treasury is directly proportional to the amount of timber sold. The products obtained from this alternative would constitute approximately 95% of the annual sales program of the Tuskegee National Forest.

Alternative 3 (No Herbicide)

This alternative produces essentially the same effects as discussed in Alternative 2, except that site preparation costs would be less since herbicides would not be used.

Alternative 4 (Thinning Only)

The economic effects of this alternative would be similar to Alternatives 2 and 3. This alternative produces a lower volume to be harvested than Alternatives 2 or 3. The volume from this alternative would be 20% of the annual sales program, based on Alternatives 2 and 3.

The result of Alternative 4 produces a smaller positive return than Alternative 2. As illustrated in Table 3.D.1-2, net income from a sale would be \$114,500,000 after allowing for the 10% road and trail deduction and NFF requirements. Most of the net income would be brought back to the sale area for reforestation and habitat improvement projects.

Unavoidable Adverse Impacts

The application of management prescriptions, standards and guidelines, best management practices, monitoring, and adaptive management would limit the extent, severity, and duration of any adverse environmental effects. Mitigation measures are also reflected in the management prescriptions in the RLRMP and some specific mitigation is discussed within each resource effects section of this document. Nevertheless, some adverse effects are unavoidable under any of the alternatives.

Most unavoidable adverse effects are transitory. For example, air quality would diminish on a recurring but temporary basis due to the use of prescribed fire. Although standards and guides require burning during times of greatest smoke dispersion, the presence of smoke and haze could detract from visitor's expectations of clean air. Some impacts to the visual qualities of the Forest landscape may be inevitable. Other short-term unavoidable adverse effects could include sediment production and run-off from fires, silvicultural practices, or road construction, reconstruction, and maintenance. This project requires only temporary road construction and these roads would be re-vegetated upon completion of the proposed activity. Standards and guides, best management practices, and monitoring plans would minimize and mitigate adverse effects; however, it is currently not technically feasible to avoid all sediment mobilization. Unavoidable adverse affects could translate into a small, but never the less detectable, reduction in downstream water quality and aquatic habitat loss.

Likewise, disturbance, displacement, or loss of fish and wildlife habitat may occur as a consequence of habitat reduction or increased human activity. Human access and resulting adverse impacts on natural communities is generally increasing and yet unavoidable, regardless of the selected alternative. Disease, pests, and storm damage will occur at one time or another, creating changes in the appearance and function of the landscape. Such adverse affects may be localized and could be of either temporary or long-term duration.

For detailed disclosure of all effects, including unavoidable adverse effects, see chapter 3 of the FEIS for the RLRMP for the national forests in Alabama, for environmental consequences discussions covering the various resource areas (air, water, biological, recreation, etc.).

Irreversible/Irretrievable Commitment of Resources

Irreversible commitments are decisions affecting non-renewable resources such as soils, minerals and cultural resources. Such commitments of resources are considered irreversible because the resource has been destroyed, removed or has deteriorated to the point that renewal can occur only over a long period or at great expense.

Irretrievable commitments represent resource uses or opportunities that are foregone or cannot be realized during the planning period. These decisions are reversible, but the production opportunities foregone are irretrievable. An example is the allocation of management prescriptions that do not allow timber harvests where the trees could have been part of the suitable base. For the period these allocations are made, the opportunity to produce timber from these areas is foregone.

Incomplete or Unavailable Information

The Tuskegee National Forest has used the most current scientific information available and state-of-the-art analytical tools to evaluate management activities and to estimate their environmental effects.

However, gaps exist in our knowledge. The Council on Environmental Quality regulations discuss the process for evaluating incomplete and unavailable information (40 CFR 1502.22 (a) and (b)). Incomplete or unavailable information is noted in the FEIS for the RLRMP for the National Forest in Alabama.

Monitoring is designed to evaluate assumptions and predicted effects. Should new information become available, this document will be amended to meet Forest Plan requirements.

Environmental Justice

A specific consideration of equity and fairness in resource decision-making is encompassed with the concerns of environmental justice. As required by Executive Order 12898, all federal actions must consider potentially disproportionate effects on minority or low-income communities. Principles for considering environmental justice are outlined in Environmental Justice Guidance under the National Environmental Policy Act (Council on Environmental Quality 1997). Those principles were considered in this analysis.

The Socio-Economic portion of this chapter identified the demographics of the Tuskegee, Macon County, Alabama area. The county is predominately African American with a median house income of \$ 21,180 annually. There are standards in place in the Revised Plan that protect traditional cultural uses of the National Forests. During the extensive public involvement phase of this planning process, where we looked at land allocation (of management emphases) scenarios, environmental justice issues did not arise.

Since there was no mention of environmental justice concerns during the scoping process for this project, there is no evidence to believe that minority or low-income groups will be adversely or disproportionately affected by the alternatives that have been presented in this document. Results from a recent survey supports this notion. The “*Public Survey Report, Southern Appalachian National Forests, Bankhead & Talladega and Tuskegee & Conecuh National Forests*” (Cordell et al. July, 2002) provided the Forest Service with a profile of the individual attitudes and values toward management activities, including recreation, on the national forests in the Southern Appalachian Region. The survey, (Table 9), revealed that attitudes toward various management issues on National Forest System lands are very similar between minority groups and Caucasians for most activities. Therefore, impacts resulting from changes in recreation opportunities, or other management activity, under any alternative would not be expected to have a disproportionate impact on any minority group, or income group.

Chapter 4 Consultation with Others

4.1 List of Preparers

The Forest Service consulted individuals, Federal, State, and local agencies, tribes and non-Forest Service persons during the development of this environmental assessment. The list of those consulted and the members of the Interdisciplinary Team are listed below.

Table 4.1 ID Team

Name	Title	Agency/Forest/ Location
Willie Humphrey	Forester, ID Team Leader	Forest Service, TNF
Jorge J. Hersel	District Ranger	Forest Service, TNF
Rhonda S. Stewart	Botanist	Forest Service, NFs in AL
J. Edwards	Hydrologist	Forest Service, NFs in AL
Art Goddard	Soil Scientist	Forest Service, NFs in AL
Dagmar Thurmond	Wildlife Biologist	Forest Service, NFs in AL
Robert Pasquill	Archeologist/Historian	Forest Service, NFs in AL
Bob McEldowney	Landscape Architect	Forest Service, NFs in AL

4.2 Consultation with others

State Historic Preservation Officer for Alabama
USDI, Fish and Wildlife Service

Glossary

4.3 Terms used in this Document

Age class - A grouping of trees by age according to an interval of years, usually 10 years. A single age class would have trees that are within 10 years of the same age, such as 1-10 years or 11-20 years.

Basal area (BA) - The area of the cross-section of a tree trunk near its base, usually 4½ feet above the ground, expressed in square feet. Basal area is a way to measure the density of a stand, or how much of a site is occupied by trees. The term basal area is often used to describe the collective basal area of trees per acre.

BMP (Best Management Practice) - Practices designed to prevent or reduce water pollution.

Board foot - A measurement term for lumber or timber. It is the amount of wood contained in an unfinished board 1 inch thick, 12 inches long, and 12 inches wide.

Browse - Young twigs, leaves, and tender shoots of plants, shrubs, or trees that animals eat.

Buffer - A land area that is designated to block or absorb unwanted impacts to the area beyond the buffer. Buffer strips along a trail could block views that may be undesirable. Buffers may be designated next to wildlife habitat to reduce abrupt change to the habitat.

Burning (prescribed) - The application of fire, usually under existing stands and under specified conditions of weather and fuel moisture, in order to attain silvicultural or other management objectives.

Canopy - The part of any stand of trees represented by the tree crowns. It usually refers to the uppermost layer of foliage, but it can be used to describe lower layers in a multi-storied forest.

CISC (Continuous Inventory of Stand Condition) - A database system that maintains current information about forest stands, such as size, age, and dominant tree species, as well as administrative information, such as the desired future dominant tree species and management classifications related to the Forest Plan.

Clearcut - A harvest in which all or most of the trees are removed in one cutting. Currently on the Tuskegee National Forest, this practice is only being used to restore off-site species on the uplands to native longleaf pine and as such, is often referred to as a restoration cut. All existing longleaf pines are retained on these sites, unless thinning of them is needed. This practice is also referred to as a clearcut with reserves.

Clearcutting with reserves - A two-aged regeneration method in which varying numbers of reserves trees not harvested to attain goals other than regeneration.

Compartment - An administrative unit or portion of a forest, usually contiguous and composed of a variety of forest stand types, defined for the purposes of a location reference.

Cubic foot - A unit of measure reflecting a piece of wood 12 inches long, 12 inches wide, and 12 inches thick.

Cumulative effects - Effects on the environment that result from separate, individual actions that, collectively, may become significant over time.

Cunit – A unit of measurement equivalent to 100 cubic feet of solid wood. Commonly, 100 cubic feet is expressed as 1 CCF.

DBH (diameter at breast height) - The diameter of a tree located 4½ feet above the ground on the uphill side of a tree.

Desired future condition - An expression of resource goals that have been set for a unit of land, often written as a narrative description of the landscape as it will appear when the goals have been achieved.

Developed recreation site – A discrete place containing a concentration of facilities and services used to provide recreation opportunities to the public significant investment in facilities and management under the direction of an administrative Unit in the national Forest Service

Dispersed recreation – Recreation opportunities or use that occurs in the general forest area. It does not take place in developed sites.

Disturbance (ecology) – Any relative discrete event in time that disrupts the ecosystem, community, or population structure and changes resources, substrate availability, or the physical environment.

Diversity - The distribution and abundance of different plant and animal communities and species within an area.

Drum chop - A method used to prepare areas for reforestation/planting that uses a large drum (with 10-14 inch blades attached). Water can be added for additional weight. The drum chops residual stems and/or brush on a site. A prescribed burn often follows. This method facilitates planting and reduces understory competition with the planted seedlings.

Ecology - The interrelationships of living things to one another and to their environment, or the study of these interrelationships.

Ecosystem - An arrangement of living and non-living things and the forces that move among them. Living things include plants and animals. Non-living parts of ecosystems may be rocks and minerals. Weather and wildfire are two of the forces that act within ecosystems.

Endangered species - A plant or animal that is in danger of extinction throughout all or a significant portion of its range. Endangered species are identified by the Secretary of the Interior in accordance with the Endangered Species Act of 1973.

Environmental analysis - An analysis of alternative actions and their predictable long and short-term environmental effects. Environmental analyses include physical, biological, social, and economic factors.

Environmental Assessment (EA) - A concise public document that briefly provides sufficient evidence and analysis for determining whether to prepare an Environmental Impact Statement or return to a finding of no significant impact. EA's aid an agency's compliance with the National Environmental Policy Act when no Environmental Impact Statement is necessary and facilitates preparation of a statement when one is necessary.

Even-aged management - A system of forest management actions that result in the creation of stands of trees in which the trees are essentially the same age (\pm 10 years). Regeneration of these stands is generally accomplished either artificially (clearcut and plant) or naturally (seed tree or shelterwood system).

Fire regime - A generalized description of the role fire plays in the ecosystem. It is characterized by fire frequency, predictability, seasonality, intensity, duration, scale (patch size), and regularity or variability.

Forage - All browse and non-woody plants that are eaten by wildlife and livestock.

Forb - A broadleaf plant that has little or no woody material in it.

Foreground - The part of a scene or landscape that is nearest to the viewer.

Forest health - A perceived condition of a forest derived from concerns about factors as its age, structure, composition, function, vigor, presence of unusual levels of insects or disease, and resilience to disturbance. This is a measure of the robustness of forest ecosystems.

Forest type - A category of forest defined by the dominant cover tree vegetation.

Fuels - Plants and woody vegetation, both living and dead, that are capable of burning.

Game species - Any species of wildlife or fish that is harvested according to prescribed limits and seasons.

GIS (geographic information system) - An information processing technology to input, store, manipulate, analyze, and display spatial resource data. GIS is an electronic medium for processing map information and is used to support decision-making processes about a land base and its resources.

Habitat - The area where a plant or animal lives and grows under natural conditions.

Habitat type - A way to classify land area. A habitat type can support certain climax vegetation, both tree and undergrowth species. Habitat typing can indicate the biological potential of a site.

Heritage resource - The physical remains of sites, structures, buildings, networks, or objects used by people in the past. They may be historical, prehistoric, archaeological, or architectural in nature. Cultural resources are non-renewable.

Interdisciplinary team (id team) - A team of individuals with skills from different disciplines (forestry, wildlife biology, hydrology, etc.) that focuses on the same task or project; often responsible for conducting an environmental analysis, and for making recommendations to the responsible official (District Ranger or Forest Supervisor).

Intermediate cut - The removal of trees from a stand sometime between the beginning or formation of the stand and the regeneration cut. Types of intermediate cuts include thinning, release, and improvement cuttings.

Irreversible - A category of impacts mentioned in statements of environmental impacts that applies to non-renewable resources, such as minerals and archaeological sites. Irreversible effects can also refer to effects of actions that can be renewed only after a very long period of time, such as the loss of soil productivity.

Leave tree - A tree (marked to be) left standing for an ecological objective, such as wildlife or seed production, in an area where it might otherwise be felled. Currently on the Tuskegee National Forest, existing longleaf and shortleaf trees are designated as leave trees in restoration cuts.

Locally rare species - Species that are not listed by the Fish and Wildlife Service as threatened or endangered or by the Regional Forester as sensitive, but are ranked by the Alabama Natural

Heritage Program as being rare within the state of Alabama.

Midstory - Trees and shrubs usually 10-40 feet tall which occur to some degree in virtually all stands; usually half as tall as the overstory.

MIS (management indicator species) - A particular type of plant or animal whose population will indicate the health of the ecosystem in which it lives and, consequently, the effects of management activities to that ecosystem. MIS species are selected by land management agencies.

Mitigation - Actions taken to avoid, minimize, reduce, eliminate, or rectify the impacts of a management practice.

Mixed Stand - A stand consisting of two or more co-dominant tree species.

Monitoring - The periodic evaluation on a sample basis of management practices to determine how fully objectives have been met, and how closely management standards have been applied.

Mortality - Dead or dying trees resulting from forest fire, insects, disease, or climatic factors.

Multiple use - The management of all the various renewable surface resources of the National Forest System so that they are used in a manner that will best meet the needs of the American people.

NEPA (National Environmental Policy Act) - Congress passed NEPA in 1969 to encourage productive and enjoyable harmony between people and their environment. It was created to promote efforts that will prevent or eliminate damage to the environment, biosphere, and stimulate the health and welfare of humanity.

No action alternative - The most likely condition expected to exist in the future if management practices continue unchanged.

Objective - A concise, time-specific statement of measurable planned results that respond to pre-established goals. It forms the basis for further planning to define the precise steps to be taken and the resources to be used in achieving identified goals.

Off-site - Any species growing on a site historically occupied by a different species, regardless of how well or poorly the off-site species is growing. As it pertains to this Environmental Assessment, off-site species are slash and loblolly, and various hardwood species growing on longleaf pine sites.

Old growth - An ecosystem distinguished by old trees and related structural attributes. Old growth encompasses the later stages of stand development that often contain several canopy layers, variety in tree sizes and species, decadent old trees, and standing and dead woody material.

Overstory - Trees in a stand that are the tallest, occupying the dominant and co-dominant crown classes, and provide closure or shade to the midstory and understory species.

Pets species - Proposed, Endangered, Threatened, Sensitive, and Locally Rare Species.

Prescribed burn - Fire set intentionally in wildland fuels under prescribed conditions and circumstances to achieve a specific objective (such as removal of midstory competitive vegetation or disposal of fuels). Burns are conducted in accordance with prescribed fire plans and are also designed to stimulate grasses, forbs, shrubs, or trees for wildlife, recreation, or

timber management purposes. Burns may be initiated during the dormant or growing season, depending on the objective of the burn.

Public land - Land for which title and control rests with a government-Federal, state, regional, county, or municipal.

Pulpwood - Timber generally less than 10" DBH and utilized by the paper and pulp industry.

Recreation – Leisure are time activities such as swimming, picking, swimming, camping, and hunting.,

Reforestation - The restocking of an area with forest trees, by either natural or artificial means, such as planting.

Regeneration - The renewal of a tree crop by either natural or artificial means. The term is also used to refer to the young crop itself.

Regional Forester - The official of the USDA Forest Service responsible for administering an entire region of the U. S. Forest Service.

Relic Tree(s) – Relic trees are individual trees or groups of remaining on site from an earlier stand.

Responsible official - The Forest Service employee who has been delegated the authority to make decisions and carry out a specific planning action.

Restoration (of ecosystems) - Actions taken to modify an ecosystem to achieve a desired, healthy, and functioning condition.

Restoration cut - Removal of off-site species from a site while retaining any on-site species that may still be present; similar to a clearcut except that on-site species are designated as leave trees and are not cut.

Revegetation - The re-establishment and development of a plant cover by either natural or artificial means, such as re-seeding.

Riparian - Land areas directly influenced by water. They usually have visible vegetative or physical characteristics showing this water influence. Streamside, lake borders, and marshes are typical riparian areas.

Road density - A measure of the total length of road in any given unit of area, such as 4 miles per square mile.

ROD - Record of Decision; a concise public document in which a responsible official states the alternative that will be implemented based upon a final environmental impact statement.

Rotation - The number of years required to establish and grow timber crops to a specified condition of maturity.

Sawtimber - Trees that are 9.6 inches in diameter at breast height or larger that can be made into dimension lumber.

Scoping - The ongoing process to determine public opinion, receive comments and suggestions, and determine issues during the environmental analysis process. It may involve public meetings, telephone conversations, or letters.

Sensitive species - Plant or animal species that are susceptible to habitat changes or impacts

from activities. The official designation is made by the USDA Forest Service at the Regional level and is not part of the designation of Threatened or Endangered Species made by the U.S. Fish and Wildlife Service.

Shelterwood - Removing part of the trees in a stand with a series of two or more cuttings so new seedlings can become established from the seed of older trees selected to be left as the "seed trees" for the new stand.

Silviculture - The art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands. Silviculture entails the manipulation of forest and woodland vegetation in stands and on landscapes to meet the diverse needs and values of landowners and society on a sustainable basis.

Site preparation (site prep) - The preparation of the ground surface prior to reforestation. Various treatments are applied as needed to remove competing vegetation, slash, roots, and stones from a site in order to enhance the survival and growth of seedlings or to enhance the germination of seeds.

Skidding - A term for moving logs by dragging from stump to roadside, deck, or other landing or collection point.

Slash - The residue left on the ground after timber cutting or after a storm, fire, or other event. Slash includes unused logs, uprooted stumps, broken or uprooted stems, branches, bark, etc.

Stand - A contiguous group of trees sufficiently uniform in age-class distribution, composition, and structure, and growing on a site of sufficiently uniform quality, to be a distinguishable unit.

Goals, Objectives and Standards- Goals and objectives define the general direction for management for the Forest and standards define the rules applied during implementation of activities associated with this plan. Standards are the specific technical resource management directions and often preclude or impose limitations on management activities or resource uses, generally for environmental protection, public safety, or to resolve an issue.

Thinning - A type of cut made to reduce stand density of trees primarily to improve growth, enhance forest health, or to recover potential mortality.

Threatened species - Those plant or animal species likely to become endangered throughout all or a specific portion of their range within the foreseeable future as designated by the U.S. Fish and Wildlife Service under the Endangered Species Act of 1973.

TSI (timber stand improvement) - Actions to improve growing conditions for trees in a stand, such as thinning, pruning, prescribed fire, or release cutting.

Understory - The vegetation growing below the canopy of other plants. This term usually refers to grasses, forbs, and low shrubs growing under a brush or tree canopy.

Vegetation management - Activities designed primarily to promote the health of forest vegetation for multiple-use purposes.

Viable population - Self-sustaining populations that are adequately distributed throughout their range.

Scenery integrity objective - A desired level of excellence based on the physical and sociological characteristics of an area. Refers to the degree of acceptable alterations of the

characteristic landscape. Objectives include Very High, High, Moderate, Low and Very Low.

Visual resource - The composite of basic terrain, geological features, water features, vegetative patterns, and land-use effects that typify a land unit and influence the visual appeal the unit may have.

Watershed - The entire region drained by a waterway (or into a lake or reservoir). More specifically, a watershed is the total area above a given point on a stream that contributes water to the flow at that point.

Wetlands - Areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions.

Wildfire - Any wildland fire that is not a prescribed fire.

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