

ENVIRONMENTAL ASSESSMENT

**Davenport Mountain Forest Stewardship Project
Chattahoochee National Forest
Brasstown Ranger District
Union County, Georgia**

December 2005

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U.S.D.A. Forest Service

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CHAPTER 1 INTRODUCTION

BACKGROUND

The Davenport Mountain area is located on the western shore of Lake Nottely in Union County, Georgia (Fig. 1). It is the largest contiguous block of National Forest land on Lake Nottely. Most of the land was acquired by TVA in the 1930's for construction of Lake Nottely and was conveyed to the Forest Service in 1959. The Forest Service acquired additional tracts in the 1950's, 1960's and 1970's. Mixed shortleaf pine/oak forests were the predominant forest community of the area at the time of Forest Service acquisition. However, in the last 30 years, the area has experienced several outbreaks of Southern Pine Beetle (SPB), which has greatly impacted the native shortleaf pine communities. Shortleaf pines have been eliminated or have been greatly reduced in many of the mixed shortleaf pine-oak stands. Many of the larger SPB spots have been regenerated to white pine plantations.

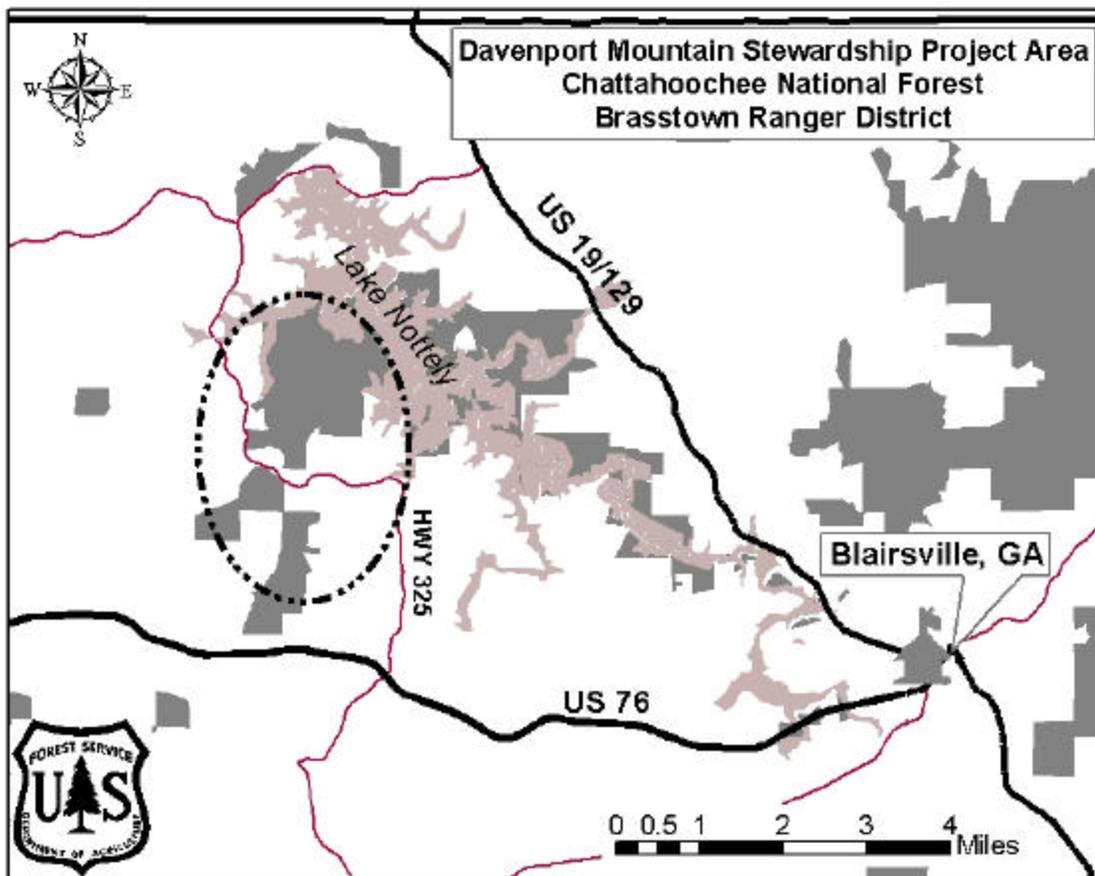


Figure 1. Davenport Mountain Project Area

PURPOSE AND NEED FOR ACTION

The purpose and need for this project is to move the area towards the desired condition in the Forest Plan by restoring the area to a more natural appearing landscape. This will be accomplished by restoring approximately 800 acres of existing white pine plantations and degraded oak stands to shortleaf pine-oak forests.

In addition to moving the area towards the desired conditions, this project also will address a number of Forest Plan goals and objectives. Along with the maintenance and restoration of approximately 800 acres of native shortleaf pine-oak ecosystems, the project will also provide for a diversity of wildlife habitats by renovating 20 acres of existing wildlife fields order to establish more desirable forage species (clover and native warm-season grasses); enhance fishing habitat through the construction of fish attractors/cover in Lake Nottely; provide for high quality recreational opportunities and improved safety on the Davenport Mountain ATV trail system through trail relocation; reduce risks of wildfire by prescribed burning and the construction of a fire break along 2 miles of property line adjoining private subdivisions; protect and enhance scenic values of the Davenport Mountain area; and control invasive species.

The specific goals and objectives to be addressed include:

Goal 3 - Enhance, restore, manage, and create habitats as required for wildlife and plant communities, including disturbance-dependent forest types (Addresses objectives related to the restoration of shortleaf pine forests (Objective 3.1), woodlands (Objective 3.4), oak and oak-pine forests (Objectives 3.6 and 3.7).

Goal 8 – Contribute to the maintenance or restoration of native tree species...(Addresses objectives related to maintenance of shortleaf pine forests in desired conditions (Objective 8.1)

Goal 27 – Provide a stable supply of wood products as an *outcome* of achieving non-timber objectives

Goal 29 – Protect and enhance the scenic/aesthetic values and Landscape Character of the National Forest lands in the Southern Appalachians...by meeting all adopted Scenic Integrity Objectives on Forest Service lands within individual management prescriptions.

Goal 30 – Provide a variety of Landscape Character themes with the predominant themes being Natural Appearing, Natural Evolving, and variations of these themes.

Goal 31 - Provide a spectrum of high quality, nature based recreation settings and opportunities.

Goal 32 – Provide for the physical security of the forest visitor commensurate with the recreation setting.

Goal 58 - Reduce risks of wildfire through fuel treatments that restore and maintain conditions of fire regime Condition Class 1 to the extent practicable (Addresses objectives related to the wildland urban interface (Objectives 58.1 and 58.2))

FOREST PLAN DIRECTION

The scope and purpose of this proposal is consistent with the 2004 Forest Plan goals. Desired Conditions for the applicable Management Prescription for the project area is summarized below.

The Davenport Mountain area lies within Management Prescription 7.E.1, Dispersed Recreation Areas. These areas receive moderate to high recreation use and are managed to provide a variety of recreation opportunities in a setting that provides quality scenery, numerous trails and limited facilities. OHV trail systems are permissible. The management emphasis is to improve the settings for non-formal outdoor recreation in a manner that protects and restores the health, diversity, and productivity of the watersheds. The desired condition for this area is to provide a landscape that is naturally appearing with variations in native tree sizes and ages. Existing old fields and openings for wildlife may be present, maintained, and expanded. Scenic Integrity Objectives are moderate to high. The lands are classified as unsuitable for timber production, however, salvage sales, sales necessary to protect other multiple-use values, or activities that meet other Plan goals and objectives are permitted

The proposed treatments would help meet Forest Plan direction and would move this area toward the desired condition envisioned.

PROPOSED ACTION TO MEET THE PLAN

This proposed action includes the following activities:

1. Thinning of white pine plantations: This activity will consist of commercially thinning approximately 257 acres of white pine plantations and the precommercial thinning of 90 acres of white pine plantations (Table 1). The ages of these plantations range from 13 to 43 years. A timber sale will be used to thin these stands. If the younger pine stands are of commercial size when the project is implemented they will be thinned as part of the planned timber sale. If they are not of commercial size, they will be mechanically thinned leaving the stems on site. These stands are located as follows: Compartment 407, Stands 3 & 6, Compartment 408, Stands 1, 2, 3, 11, 14, 16, 17, 19, 20, 21, 23, 29, 30, 31, & 34 and Compartment 416, Stands 2, 10 & 25. Most of these stands are stocked at approximately 200 to 300 stems per acre. These stands will be thinned to approximately 60 to 80 stems per acre. This will create enough space to start converting these stands back to a mixed shortleaf pine and oak timber type. This conversion will involve periodic prescribed burning and interplanting of oak and shortleaf pine seedlings. Approximately 1 mile of temporary road will be required, utilizing existing, closed roads and portions of the ATV trail.

The planted and natural oak and shortleaf pine trees will be released if needed, using herbicides after 1 to 3 years of planting using a combination of the following application methods: 1) a spot foliar treatment with an herbicide mixture containing the active ingredients triclopyr (ester) and imazapyr; 2) basal stem spraying (for trees and shrubs less than 3 inches in diameter) with an herbicide with the active ingredient triclopyr (ester formulation); 3) hack and squirt method (for trees and shrubs between 3 and 8 inches in diameter) with an herbicide with the active ingredient triclopyr (amine formulation) or glyphosate, depending on the time of year of application; and 4) cutting trees and then treating the cut stumps with an herbicide with the active ingredient triclopyr (amine) or glyphosate to prevent stump sprouts from the cut trees from becoming established. Treatment of species such as red maple, white pine, black locust, sassafras, rhododendron, and mountain laurel would occur throughout the stands. The objective is to control competing vegetation to allow species such as shortleaf pine and oak to be re-established. Application rates for herbicides are discussed in further detail in Appendix B, Results of Risk Analysis.

Table 1. White pine stands proposed for thinning in the Davenport Mountain Forest Stewardship project.

Comp/Stand	Age Year	Acres	Treatment
407/03	1983	23	Commercial Thinning
407/06	1983	23	Commercial Thinning
408/01	1983	33	Commercial Thinning
408/02	1992	36	Non-Commercial Thinning
408/03	1983	12	Commercial Thinning
408/11	1992	12	Non-Commercial Thinning
408/14	1988	20	Commercial Thinning
408/16	1990	10	Non-Commercial Thinning
408/17	1982	16	Commercial Thinning
408/19	1984	21	Commercial Thinning
408/20	1983	26	Commercial Thinning
408/21	1962	15	Commercial Thinning
408/23	1992	10	Non-Commercial Thinning
408/29	1964	7	Commercial Thinning
408/30	1988	16	Non-Commercial Thinning
408/31	1985	21	Commercial Thinning
408/34	1983	20	Commercial Thinning
416/02	1962	11	Commercial Thinning
416/10	1988	6	Non-Commercial Thinning
416/25	1970	9	Commercial Thinning

2. Thinning of Virginia pine plantation: This activity will take place in Compartment 408, Stand 9 (44 acres). This stand was planted in 1990 with a Virginia pine and shortleaf pine mixture. In this stand, all Virginia pine would be removed leaving shortleaf pine with a stem density of approximately 40 trees per acre. The stand would be allowed to become a shortleaf pine/hardwood type. Oak seedlings would be planted if needed to fulfill the hardwood component of this stand. If needed, herbicide release of the planted seedlings would be accomplished using the methods described in Item #1 above.

3. Oak/ Shortleaf Pine Woodland Restoration: This activity will take place on approximately 390 acres in Compartment 416, stands 4-9,11-13,15, 20, 22, and, 23 (Table 2). The oak/shortleaf pine stands in this area have had repeated mortality from Southern Pine Beetle attacks and wind throw from Hurricane Opal in 1995. This area will be thinned and followed by periodic treatments of prescribed burning and herbicide as needed over the next ten years to help create an open oak-pine woodland community. Thinning would take place only on the upper and mid-slopes. Areas within these stands that are cove sites will not be thinned. Remnant shortleaf pines would be left in the thinned areas provide a seed source and to retain the representation of this important native species in the oak-pine ecosystem. Approximately 3/4 mile of temporary road will be required, utilizing existing, closed roads and portions of the OHV trail.

If needed, herbicides would be used in conjunction with burning to reduce the vigorous sprouting of shade tolerant and fire intolerant species that take light, water and nutrients from desired herbaceous ground cover using the methods described in Item #1 above.

Table 2. Stands proposed for Oak/Shortleaf Pine Woodland Restoration in the Davenport Mountain Forest Stewardship project.

Comp/Stand	Forest Type	Age Year	Acres	Treatment
416/04	White Oak-N. Red Oak-Hickory	1910	63	Thin& Rx Burn
416/05	White Oak-N. Red Oak-Hickory	1902	50	Thin& Rx Burn
416/06	Loblolly Pine - Hardwood	1978	32	Thin& Rx Burn
416/07	White Oak-N. Red Oak-Hickory	1947	33	Thin& Rx Burn
416/08	Shortleaf Pine	1927	8	Thin& Rx Burn
416/09	White Oak-N. Red Oak-Hickory	1927	7	Thin& Rx Burn
416/11	Shortleaf Pine	1927	8	Thin& Rx Burn
416/12	White Oak-N. Red Oak-Hickory	1927	21	Thin& Rx Burn
416/13	White Oak-N. Red Oak-Hickory	1978	72	Thin& Rx Burn
416/15	White Oak-N. Red Oak-Hickory	1910	30	Thin& Rx Burn
416/20	White Oak-N. Red Oak-Hickory	1927	27	Thin& Rx Burn
416/22	Southern Red Oak – Yellow Pine	1927	26	Thin& Rx Burn
416/23	Southern Red Oak – Yellow Pine	1927	13	Thin& Rx Burn

4. Construction of firebreak in the Urban Interface: This activity would remove some of the fuel buildup adjacent to private property along approximately two miles of U.S. Forest Service boundary line on the southern edge of the Davenport Mountain tract. Most of this fuel consists of very thick young pine plantations adjacent to the private property. During the thinning operations mentioned in Activity 1 above, logging slash would be pulled back 40 to 50 feet from the property boundary. If any of the stands near the property boundary are not of commercial size, the material will be removed manually or processed by a chipper or mulcher and left on the site.

5. Fish and Wildlife improvement projects: This will include construction of fish attractors/cover in Lake Nottely, and the renovation of existing wildlife openings on the Brown Tract (located adjacent to Davenport Mt Compartment 408) and the Davenport Tract (located in Compartment 407).

The fish attractors will be constructed of donated Christmas Trees and brush resulting from the timber sale and non-commercial thinnings. These brush structures will be placed in selected coves in Lake Nottely during the winter drawdown period.

Existing wildlife openings dominated by fescue and annual weedy species will be renovated to order to establish more desirable species. To control the fescue present in these fields, an herbicide treatment will be applied prior to planting. Glyphosate will be applied at 1.6 pounds active ingredient per acre using a boom sprayer pulled by a farm tractor. If needed, a spot herbicide retreatment will be applied after planting to control any residual fescue. Individual fields will then be limed, fertilized, and planted to either clover and other cool season grasses (approximately 10 acres) or native warm season grasses (approximately 10 acres). Native warm season grasses to be established will include big blue stem (*Andropogon gerardii*), little blue stem (*Schizachyrium scoparium*), Indian grass (*Sorghastrum nutans*), and switch grass (*Panicum virgatum*). If needed, prescribed fire will be used to remove heavy thatch accumulations prior to planting and to maintain the fields established in native warm season grasses.

6. Relocation of ATV Trail: The section of The Davenport Mountain ATV Trail that runs concurrent with System Road 143A would be relocated for safety and to avoid user conflicts between ATV's and full size vehicles. A new section of ATV trail would be constructed paralleling System Road 143A and would be approximately ½ mile long.

7. Reforestation of Southern Pine Beetle damaged stands: This activity will include the site preparation and planting of two stands that were killed by southern pine beetle attacks. Stand 32 (12 acres) of Compartment 408 and Stand 24 (7 acres) of 416 will be planted with shortleaf pine and white oak seedlings. Chainsaws, prescribed burning and/or herbicides will be used in preparing these stands for planting. These seedlings will be released if needed, using herbicides after 1 to 3 years of planting. Herbicide site preparation and release would be accomplished using the methods described in Item #1 above.

8. Invasive Species Control. This activity would include the targeted control of invasive species using herbicides and manual methods. Approximately 3 acres of autumn olive and 1 acre of multiflora rose are proposed for control. These invasives are located in and around the wildlife openings, in several old log decks, and along a 0.4-mile section of system road. Control of the autumn olive and multiflora rose would be accomplished using a combination of the following application methods: 1) a spot foliar treatment with an herbicide mixture containing the active ingredients triclopyr (ester); 2) basal stem spraying (for trees and shrubs less than 3 inches in diameter) with an herbicide with the active ingredient triclopyr (ester formulation); 3) hack and squirt method (for trees and shrubs between 3 and 8 inches in diameter) with an herbicide with the active ingredient triclopyr (amine formulation) or glyphosate, depending on the time of year of application; and 4) cutting trees and then treating the cut stumps with an herbicide with the active ingredient triclopyr (amine) or glyphosate to prevent stump sprouts from the cut trees from becoming established.

As feasible, Nepal grass will be controlled along the existing ATV trail by manual means (hand pulling).

DECISION TO BE MADE

The decision to be made is whether or not the restoration of native shortleaf pine-oak communities, firebreak construction, wildlife habitat development, ATV trail improvements, reforestation, and invasive species control should be conducted by the using the proposed treatments or other types of treatments.

PUBLIC INVOLVMENT- ISSUE IDENTIFICATION

A letter detailing the projects was sent to 82 individuals, agencies and public organizations on June 25, 2004. (The project file includes a list of all agencies, persons and organizations contacted in the course of scoping and environmental analysis.) In addition, the proposal appeared in the quarterly Schedule of Proposed Actions for the Chattahoochee National Forest.

On site meetings were made with representatives of the Forest Service, Georgia DNR, Georgia Forest Watch, Georgia Forestry Commission, and the Lake Nottely Improvement Association. These on site meetings were conducted to clarify project proposals and activities and discuss issues and concerns.

An Interdisciplinary Team (ID Team) was formed and included the following specialists: Sheldon Henderson (Co-ID Team Leader, Silviculture), Jim Wentworth (Co-ID Team Leader, Wildlife Biology) David Kuykendall (Recreation/Trails), Peter Myers (Fire/Fuels), Dick Rightmyer (Soil Science), and Becky Bruce (Cultural Resources).

MAJOR ISSUES RELATED TO THE PROPOSED ACTION

The ID Team reviewed public as well as internal comments and developed a list of issues that might apply to the proposed action. The deciding official then determined which issues were major, and other issues, and grouped them by a common cause or effect.

Four individuals and groups responded to the scoping letter dated June 25, 2004. The ID Team reviewed public as well as internal comments, including those from ID Team members and others. Preliminary issues were analyzed and major issues were recommended to the District Ranger, the responsible official for this project. The Ranger approved the four issues listed below:

Major Issue 1: Project implementation activities, including ATV use will expose soil and may cause sedimentation into watercourses degrading water quality and stream health.

Major Issue 2: The use of herbicides pose a potential danger to humans and the environment.

Major Issue 3: Project implementation may adversely impact wildlife habitat and PETS species.

Major Issue 4: Project implementation may increase wildfire risk.

OTHER ISSUES

A worksheet documenting this determination can be found in the project file. These other issues were identified by the I.D. Team as other issues because of one or more of the following conditions:

- The issue is outside the scope of the proposal.
- The issue is already decided by law or in the Forest Plan.
- The issue is not in conflict with the proposed action.
- The issue is not supported by scientific evidence.
- The issue is limited in duration, extent, or intensity.

CHAPTER 2 ALTERNATIVES

ALTERNATIVES TO THE PROPOSED ACTION

Alternatives to the proposed action were designed to respond to the major issues. The ID Team considered three preliminary alternatives. Two of these along with the proposed action (Alternative 2) were carried forward for detailed analysis (see project file for detailed documentation). These alternatives are described below:

Alternative 1 (No Action)

None of the proposed actions would take place. Several Forest Plan Goals and Objectives would not be met and would have to be met at another location on the Forest (Table 3). This alternative would respond to all the issues by not doing the actions that prompted the issues (Table 4).

Alternative 2 (Proposed Action)

Refer to Section earlier titled “**PROPOSED ACTION TO MEET THE PLAN**” for a complete description of the initial proposal (Fig. 2).

Alternative 3

This alternative would include all the activities listed in Alternative 2 above with the following exceptions: (1) Herbicides will not be used for site preparation, release of seedlings or eradication of fescue and other invasive species listed in Alternative 2 above. Other means of control such as prescribed burning or manual methods (chainsaws) would be used. (2) Instead of rerouting the section of ATV trail that follows FS System Road 143A, this road would be closed to regular vehicular traffic and left as an ATV trail only (Fig. 3).

MITIGATION MEASURES COMMON TO ALL ACTIONS

For each alternative and the proposed action, all applicable standards in the current Land and Resource Management Plan would be applied. Some of the important mitigation measures are listed below.

1. In all stands that are to be thinned, existing skid trails and log decks will be utilized thus reducing the need to construct new skid trails and loading decks. Erosion control measures will be used on trails and decks where there is exposed

- soil. Any skid trails within 200 feet of the existing OHV trail will be filled with slash after thinning operations are completed to prevent increased illegal OHV activity. Mitigation measures for using the OHV trail as a haul road include:
- a. To the extent feasible, scheduling the project work when the trail is normally closed, weather permitting and providing information to users of other OHV opportunities in the area.
 - b. Where the trail is used for hauling/skidding, reconstruct dips and wing ditches and narrow the width of track after project work is completed.
 - c. To reduce illegal access, use increased signage, increased compliance checks, tank traps when needed and placement of warning barricades on portions of OHV trail being used as skid or haul routes.
2. All streamside management zones will be protected in accordance to “Georgia’s Best Management Practices for Forestry”.
 3. All prescribed burning activities will be carried out with approved prescribed burn plans that only allow burning under conditions that will have little impact on adjoining residential areas. Smoke management procedures will be followed.
 4. For mitigation measures for herbicide use see Appendix A.

ALTERNATIVES CONSIDERED BUT NOT FULLY DEVELOPED

The interdisciplinary team and the responsible official considered one other alternative. This alternative is discussed below as well as the reason for eliminating it from detailed study.

The alternative considered was the implement Alternative 2 except that all the white pine plantations would have been clearcut instead of thinning them. This would have provided a quicker conversion of these white pine plantations to shortleaf-oak stands. However, this alternative would not be acceptable because it exceeds the Land Management Plan prescription for this area that calls for only 4% or less in the 0 to 10 year age class. Clearcutting these stands would far exceed this. If the stands of white pine were clearcut the area also would not meet the Scenery Management Guidelines. For these reasons this alternative was dropped from further study.

COMPARISON OF ALTERNATIVES

The alternatives are compared on how well they meet Forest Plan Goals and how well the issues are addressed and analyzed. The effects of the alternatives are disclosed in Chapter 3 of the EA. Table 3 compares the proposed action and alternatives in terms of how they

meet Forest-wide Goals and Objectives. Table 4 compares the estimated environmental effects that the proposed action and alternatives would have based on the major issues.

Table 3: Comparison of Alternatives in terms of their ability to meet Forest-wide Goals and Objectives.

FOREST-WIDE GOAL	ALT. 1	ALT. 2	ALT. 3
Goal 3 – Enhance, restore, manage and create habitats as required for wildlife and plant communities, including disturbance-dependent forest types.	NO	YES	YES
Objective 3.1 – Within the first 10 years of Plan implementation, restore 1,100 acres of shortleaf pine forests on the Chattahoochee on sites where they once occurred naturally.	NO	YES	YES
Objective 3.4 – Within the first 10 years of Plan implementation, restore 10,000 acres of open woodlands, savannas, and grasslands on the Chattahoochee...	NO	YES	YES
Objective 3.6 – Within the first 10 years of Plan implementation restore oak and oak-pine forests on 1,250 acres on the Chattahoochee on appropriate sites currently occupied by pine plantations.	NO	YES	YES
Objective 3.7 – To maintain existing oak and oak-pine forests, reduce stem density on 5,500 acres on the Chattahoochee within the first 10 years of Plan implementation.	NO	YES	YES
Goal 8 – Contribute to the maintenance or restoration of native tree species whose role in forest ecosystems (a) has been reduced by past land use; or (b) is threatened by insects and diseases, fire exclusion, forest succession, or other factors.	NO	YES	YES
Objective 8.1 – To maintain shortleaf pine forests on the Chattahoochee in desired conditions: thin overstory trees on an average of 400 acres and reduce hardwood mid-story on an average of 6,000 acres per year of this forest type.	NO	YES	YES
Goal 27 – Provide a stable supply of wood products as an <i>outcome</i> of achieving non-timber objectives.	NO	YES	YES
Goal 29 – Protect and enhance the scenic/aesthetic values and Landscape Character of the National Forest lands in the Southern Appalachians...by meeting all adopted Scenic Integrity Objectives on Forest Service lands within individual management prescriptions.	YES	YES	YES
Goal 30 – Provide a variety of Landscape Character themes with the predominant themes being Natural Appearing, Natural Evolving, and variations of these themes.	NO	YES	YES
Goal 31 – Provide a spectrum of high quality, nature based recreation settings and opportunities.	YES	YES	YES
Goal 32 – Provide for the physical security of the forest visitor commensurate with the recreation setting.	NO	YES	YES
Goal 58 – Reduce risks of wildfire through fuel treatments that restore and maintain conditions of fire regime Condition Class I to the extent feasible.	NO	YES	YES
Objective 58.1 – Reduce extreme fire behavior characteristics and spotting distances by treating fuels to create a defensible space within designated wildland urban interface (WUI) zones	NO	YES	YES
Objective 58.2 – Locate and designate zones specific to wildland urban interface (WUI) fire management issues to allow for prioritization of projects and funding based on protection needs and potential.	NO	YES	YES

Table 4: How the Alternatives Address the Major Issues

ISSUE	ALT. 1	ALT. 2	ALT. 3
Issue 1 – Probability project implementation activities, including ATV use will expose soil and may cause sedimentation into watercourses, degrading water quality and stream health.	Low	Low	Low
Issue 2 – Probability the use of herbicide poses a potential danger to humans and the environment.	None	Low	None
Issue 3 – Probability project implementation may adversely impact wildlife habitat and PETS species.	None.	Low	Low
Issue 4 – Probability project implementation may increase wildfire risk due to slash generated from timber harvests.	None	Low	Low

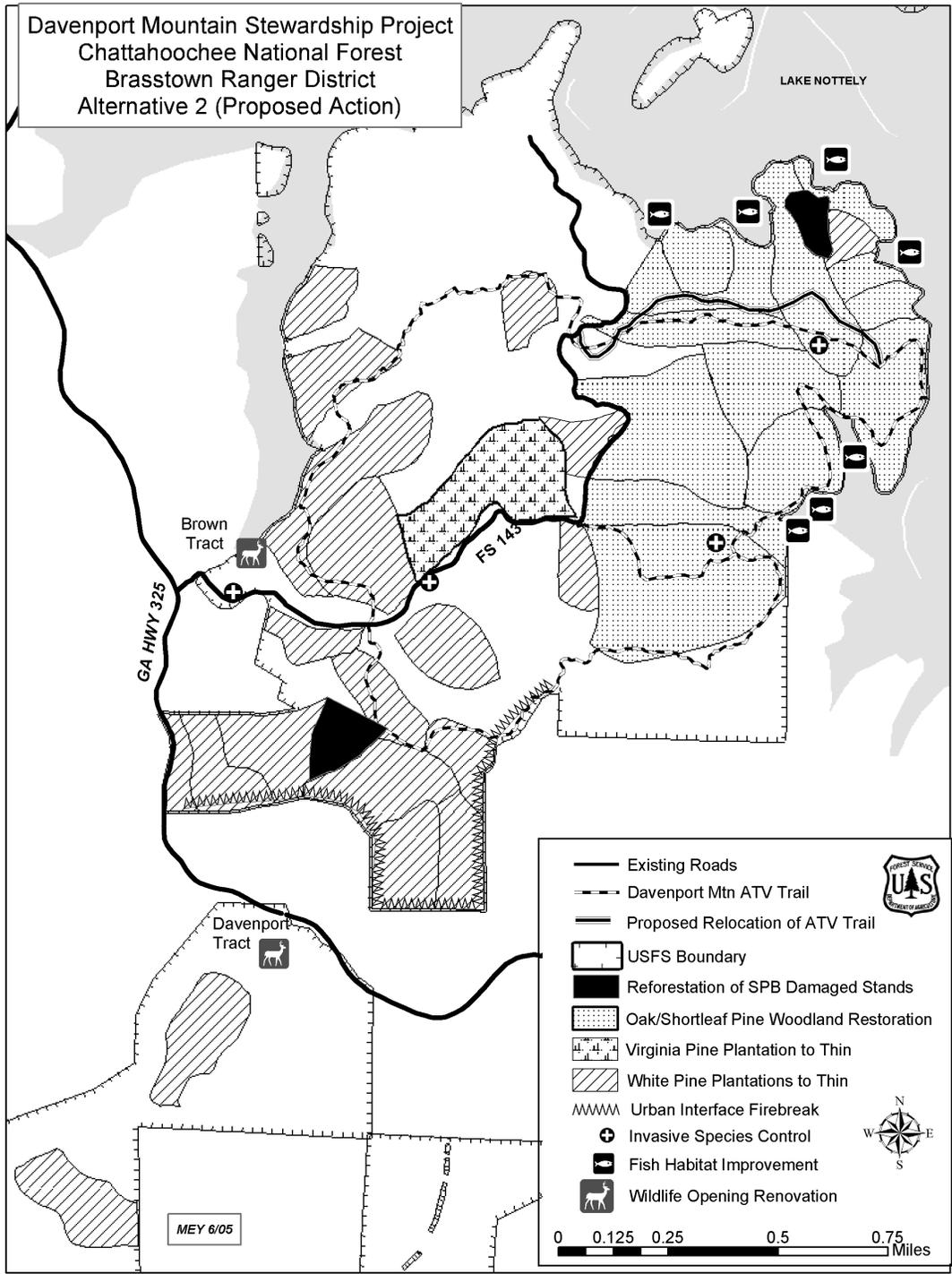


Figure 2. Map of Alternative 2 (Proposed Action)

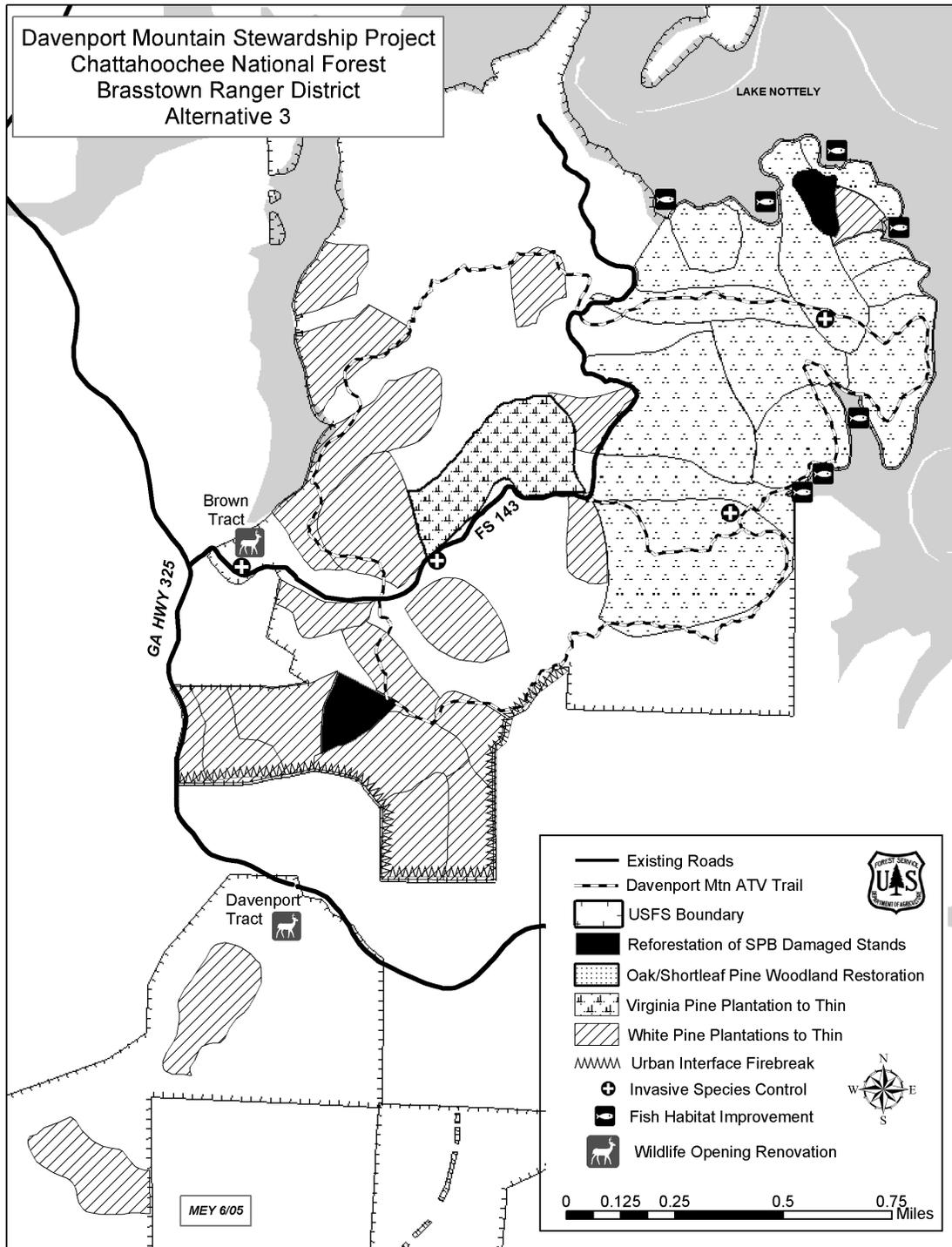


Figure 3. Map of Alternative 3.

CHAPTER 3

ENVIRONMENTAL EFFECTS

PHYSICAL ENVIRONMENT

Element - Soils

Existing Conditions

The project area is located on the Brasstown Ranger District, Chattahoochee National Forest in the vicinity of Davenport Mountain, Compartments 407, 408 and 416. The project area is on an upland landform with Lake Nottely on three sides. The ecological features of the project area are typical of the low mountain landscapes found in the Southern Blue Ridge Mountains. This area lies entirely within the Southern Blue Ridge Mountains Ecological Subsection (M221Dc) and the Nottely Lake Landtype Association (M221Dc14). Landforms include low mountains with broad side ridges descending into broad, flat valley bottoms. Much of this land area has been in human culture dating back to the Cherokee settlement period. Forest Service ownership began fire protection and stand management in the 1930s. Soils on these landform positions are deep and well drained with textures ranging from sandy loam to clay. Soil series include Clifton, Cowee, Evard, Saunook and Thurmont.

Sites with moderately well drained soils within the project areas are typically found in riparian areas such as wetlands or floodplains that occur between the uplands. These landforms and soils will be protected during the proposed treatments delineated within riparian corridors. The existing soil surveys will be consulted as needed to delineate these areas. The Forest Soil Scientist will serve as a consultant as needed to identify areas to avoid and identify appropriate mitigation measures to minimize impacts. Forest Service Roads 143, 143A and the Davenport Mountain ATV Trail exist within the boundaries of the project area. Roads 143 and 143A are permanent roads on the Forest system, totaling about 1.5 miles in length. The roads are maintained for seasonal use. The trail, suitable for ATVs and motorcycles, restricts users to riding the approximately five (5) miles of designated trail. This type of trail use confines impacts on soils to the area within the trail and allows maintenance to be used to correct adverse conditions such as erosion. A short re-route of a trail segment that parallels FS Road 143-A is included in the proposed action to minimize conflicts between users of the trail and the roads. No expansion of the trail system is proposed in the project. A parking lot for trail riders exists at the end of FS Road 143.

The table below lists the soil map units delineated within the project area. These units are characterized by slope and soil texture, and have other distinctive soil properties to be evaluated before, during and after treatments. Soil mapping units with moderate to severe limitations for treatments require appropriate mitigations to maintain soil productivity, particularly to control erosion, compaction or other effects that might reduce productivity.

Table 5 – Soil Map Units in the Davenport Mountain Project Area

Soil Map Units	Slope Gradient	Harvesting Limitations	Erosion Hazard
ThB – Thurmont fine sandy loam	2 to 6 %	Slight to moderate	Slight to moderate
ThC – Thurmont fine sandy loam	6 to 12%	Slight to moderate	Slight to moderate
CIE – Clifton-Evard complex	10 to 25%	Slight to moderate	Moderate
SaE – Saunook-Evard complex	10 to 25%	Slight to moderate	Moderate
CxF – Cowee-Evard complex	25 to 45%	Moderate	Moderate to severe

Effects of Alternative 1 (No Action)

No treatments are proposed; therefore no changes in the current soil conditions would be expected.

Effects of Alternative 2 (Proposed Action)

Soil disturbance would occur in the development of skid trails, log landings, firebreaks, construction of the ATV trail re-route and during renovation of the wildlife openings. Permanent roads adequate for the project are in place. Expected impacts to soils include compaction, rutting and erosion. Compaction can occur on the log landings and skid trails where repeated vehicle movements are normal during the processing of logs on the site. Erosion is a potential impact on areas where vegetation is removed, exposing the soil to rainfall impact and possible soil movement. Compaction and erosion can cause reductions in site productivity if not mitigated following operations.

The proposed use of herbicide applications and subsequent behavior in the proposed will not disturb the soil. Effects on soil productivity from herbicide use are addressed in the Vegetation Management Final Environmental Impact Statement (USDA Forest Service 1989: VMFEIS Vol. II, Appendix C, Neary & Michael 1988, Effect of Herbicides on Soil Productivity and Water Quality, pages C-8 to C-10). Herbicide application does not have direct effects on soils when treatments are properly implemented with BMPs. Minimal indirect effects may occur with some temporary loss of ground cover, however, research has shown that a good litter layer is usually left intact with herbicide application, which mitigates raindrop impact, promotes infiltration, and greatly reduces erosion.

Soil types within the proposed treatment areas generally have sandy or loamy surface horizons underlain by clay loam, clay or loam subsurface horizons. Glyphosate is formulated as not soil active, applied to the plants selected for treatment. This herbicide can wash off the plants and move into the soil; however it binds to soil particles or organic matter. The result is minimal translocation or leaching to water zones in these

soil types. Triclopyr has limited soil mobility and Imazapyr, which has some soil mobility in the spring, will be applied from late June through mid September when there is little to no evidence of soil mobility.

To minimize impacts to soil, treatments are designed and implemented with appropriate best management practices. During the design phase sensitive soils are identified and avoided when possible to minimize adverse impacts. Treatments are monitored during implementation to keep impacts within acceptable limits, including ceasing operations until conditions are suitable if necessary. As operations are completed log landings and skid trails will be disked to restore infiltration and then revegetated to establish ground cover. Harvesting activities may expose mineral soil, though this is expected to be less than 10% of the stand area and most would be naturally revegetated within a year after disturbance. Due to the moderate sloping topography erosion would be minimal and short-term. Skidders may affect soil microorganisms; however, effects are minor, considering the amount of area impacted. Mitigation measures are employed to minimize the short-term effects to soils. Some areas high in clay content may have long-term effects from compaction and rutting. Special care would be used when logging on high clay content soils. Mitigating measures will help to speed up soil recovery.

Over the past forty years on the Brasstown Ranger District of the Chattahoochee National Forest several hundreds of acres have been harvested and regenerated. The stands proposed for commercial thinning are typical of this management history and are at a growth stage in need of thinning to create a vigorous and healthy stand. During the harvest treatments soils with severe erosion or compaction hazard have been avoided, or impacts have been mitigated if they occurred. Soils with poor drainage, e.g. floodplains and wetlands, have been protected during previous treatments and will continue in their existing condition after the proposed treatments. One of the primary mitigation measures will be to delineate riparian corridors where these soils typically occur. Effects to soils during prior treatments and expected in the proposed thinning have been minimal, mainly along the routes used for equipment access, and the log landings used to process logs brought in from the harvest area to be removed. The effects are typically short term when proper mitigations and best management practices are implemented in project treatments.

Timber harvesting can affect nutrient cycling and soil compaction. Effects to soil productivity would vary with the intensity and frequency of treatments. Activities are planned in time, space, and intensity to avoid detrimental effects to soil productivity. Mitigation measures such as using low PSI equipment and limiting skid trails, landings and temporary roads to less than 10% of the thinned areas will be used to limit soil compaction, rutting and displacement. Slash will be scattered on skid trails to buffer the soil against vehicle pressure. If unacceptable impacts start to occur, logging will be suspended until ground conditions improve.

Compaction reduces transpiration by altering soil structure and exposed soils will temporarily increase water yield in some areas. It reduces the larger pores and pathways in the soil, decreases macropore space and soil porosity and increases soil density. It reduces productivity by retarding root growth.

Rutting and displacement of the forest floor materials can expose mineral soil causing concentrated water flow, puddling, reduction of forest nutrient supplies, lowering the available water and increasing soil density, all of which are important to plant growth. Some of the soils have different sensitivities due to differences in soil properties and quantities (e.g. topsoil depth, texture, structure). Root damage by rutting significantly reduces productivity of the remaining trees. Since fine root systems concentrate in the top foot of soil, it is imperative that soil displacement be minimized.

All management activities proposed will meet Georgia's Best Management Practices for Forestry designed by the Georgia Forestry Commission and numerous cooperators (Georgia Forestry Comm. 1999), in accordance with the State Water Quality Management Plan. Treatments will also be in compliance with applicable standards of the Forest Land Management Plan.

Heavy equipment used during harvesting is not allowed on sensitive soils when soils are wet, (VMFEIS). Mitigation measures designed to limit soil compaction include restrictions on heavy equipment when soils are wet. Forest Plan standards limit the area of soil disturbance to less than 10% of the harvest unit, reducing the area that is compacted. Litter and slash left on the site cushion the soil against vehicle pressure. If unacceptable impacts begin to occur, e.g. excess rutting, then harvesting will be suspended until ground conditions improve.

Cumulative Effects- Some of the stands proposed for commercial thinning have been previously harvested and regenerated within the past thirty years. Some of the stands have been prescribed burned to reduce fuels. Productivity loss would be greatest in the primary skid trails and log landings where soils are displaced during construction. The stands to be treated are located on moderately sloping sites so soil movement is minimal. Past management activities have contributed to some soil compaction and some loss of productivity. Soil productivity within the treatment sites remains at normal levels. When combined with the impacts of past and future projects, which would occur in the foreseeable future on Federal lands, the effects of this project on soil resources would not noticeably alter existing conditions.

Mitigating Measures - Restoring vegetation cover to log landing sites and skid trails where mineral soil is exposed and where the soil is compacted will help mitigate effects of soil compaction through encouraging vegetation to grow. The identification and protection of any problem soils or sites prior to harvest will also minimize impacts to these soils.

Forest Service Management: The most recent timber harvests in the majority of stands occurred more than fifteen years ago. Many of these stands will likely be thinned again in the future, in most cases 15 to 20 years after the initial thinning. The only other silvicultural treatment to be done on most of these stands is prescribe burning on a two to three year rotation. Mitigation measures, such as restricting mechanical operations during wet weather, would limit short term and prevent long-term impacts to soil productivity. Mitigation measures would reduce impacts from skid trails and limit the area compacted

by the heavy equipment. In temporary roads, skid trails, and logging decks, compaction would reduce tree survival and growth. Disking reduces soil compaction in temporary roads and logging decks. These skid trails can be used in future timber harvests, thereby reducing the total area impacted.

Effects of Alternative 3

This alternative would include all the activities of Alternative 2 (proposed action) with two exceptions; 1) herbicides will not be used for site preparation, seedling release or eradication of invasive species; and 2) FS Road 143-A would be closed to regular traffic and used as a segment of the existing Davenport Mountain ATV Trail, after closure. Closure of the abandoned FS Road 143-A will result in an improvement in soil productivity on sections not used as a trail.

The effects of proposed activities on soils in Alternative 3 would be about the same as stated in Alternative 2.

Element – Water

The Davenport Mountain project area is located on an upland area west and south of the main channel of Lake Nottely, located in Union County, Georgia. The streams on the east side of Davenport Mountain drain to the east to the main channel of Nottely Lake and on the west side into Low Creek, a tributary channel of the Lake. The project area is located in the Nottely River-Nottely Lake hydrologic unit (fifth level code 0602000208). Nottely Lake is a reservoir impoundment formed by Nottely Dam and is owned and administered by the Tennessee Valley Authority. Uses authorized include power generation, flood control and recreation.

Existing Conditions

Streams within the project area are mostly 1st and 2nd stream orders. This is characteristic of upper side slope and ridge top topographic positions, commonly called “headwaters” in stream systems. One major perennial stream, Low Creek, west of the project area is a 3rd order streams because it has collected smaller tributary streams as they flow down the side slopes. In each of these streams, sediment levels increase after rainfall storm events. One major source of sediment is runoff from dirt and gravel roads. Another, less obvious, source is sediment already in the streams from several sources that is moved by increased water volume and flow after storm events.

Streams within the project area are generally characterized as small perennials or intermittent characteristic of the low-mountain and broad valley landforms of the area. Channels are shallow and narrow with gravel bottoms. Some portions of stream channels on the west side of the project area have been altered or impacted during previous private ownership, mainly for farming activities. Water quality in the streams is generally moderate to high, with some periods of turbidity during storm events. The streams are not

classified as trout streams by the DNR Wildlife Resources; however the beneficial use would be fishing.

Stream crossings on the small streams are the main point of entry for adverse effects on water quality such as potential input of sediment. Existing crossings in place include one on Forest Service Road 143, and approximately five crossings on the Davenport Mountain ATV Trail in the area. Each crossing is maintained to minimize sediment input from the road and trail prism.

Effects of Alternative 1 (No Action)

Direct Effects - When eroded soils are delivered to the stream system, they can fill interstitial space between substrate particles, fall out of the water column and get deposited on the stream bottom, or continue to be transported downstream to other stream reaches. In this alternative the existing FS Roads 143 and 143A (1.5 miles) and the Davenport Mountain ATV Trail (5 miles) will continue to be sources of erosion and sediment. Erosion will continue at levels described for existing condition over 4 to 5 acres, and could increase over time as users continue to create disturbed areas adjacent to the current travel way.

Indirect Effects - Indirect effects include the delivery of eroded soil to stream channels resulting in the loss of aquatic habitats, the loss of total pool volume downstream, or a shift in substrate particle size distribution downstream of road segments.

Cumulative Effects - Ground disturbing impacts implemented in the past 5 years in the project vicinity have been limited to the existing road and ATV trail. No additional actions are currently proposed or expect to be proposed in the reasonably foreseeable future within the analysis area that would add to the erosion and sedimentation currently occurring within the disturbed acres of the road template.

Effects of Alternative 2 (Proposed Action)

Direct Effects - Ground disturbance will occur in the development of temporary roads, skid trails, and log landings during the commercial thinning operations. Stream channels will be protected in the project area by the delineation of riparian corridors and the implementation of the standards in the Forest Plan related to this zone along streams. Low levels of erosion may occur with this ground disturbance. When eroded soils are delivered to the stream system, they can fill interstitial space between substrate particles, fall out of the water column and get deposited on the stream bottom, or continue to be transported downstream to other stream reaches. In this alternative short-term erosion will continue during the period of thinning treatments, particularly in the vicinity of skid trails and log landings. Erosion may continue for 6 months to 1 year after completion until adequate ground cover is restored. Maintenance of stream crossings and road approaches will also reduce sedimentation downstream of the crossings. This alternative will continue to allow vehicle access along the existing FS Roads and the ATV trail,

resulting in the potential for continued erosion for the entire length of the road (1.5 miles of open road) unless road maintenance is applied on a regular basis.

Complying with and meeting the intents of the Forest Plan Standards and Guidelines for individual project areas and State of Georgia BMPs can protect the beneficial uses of water near project areas. Monitoring by Forest Service personnel can serve to help determine when implementation of such protective practices has occurred and their effectiveness. All applicable mitigation measures contained in the Vegetation Management in the Appalachian Mountains FEIS (VMFEIS), issued in July 1989, would be followed. A complete discussion of the effects of herbicides is contained in this FEIS, to which this document tiers. Current risk assessments for Glyphosate, Imazapyr and Triclopyr may be found at: www.fs.fed.us/foresthealth/pesticide/risk.htm.

Glyphosate is not considered soil active and Triclopyr has limited soil mobility. Imazapyr appears to bind loosely to clay particles and organic matter. It has relatively low soil mobility; soil activity expresses itself during the period of spring leaf expansion but applications made from late June through mid September produce little or no evidence of soil activity. With the provision of riparian buffer strips on stream zones, the risk of herbicide spills or movement into stream zones is further reduced.

There is a possibility that chemical herbicides may enter streams during treatment by direct application or drift or after treatment by surface runoff or subsurface movement. The risk of entry of chemical herbicides into surface waters is discussed in the Risk Assessment, Appendix A of the VMFEIS, Vol. II, 1-10. Direct application of herbicide to surface water will not occur under the Proposed Action.

Drift of herbicides into surface water is influenced by application method, the existence of buffers and weather conditions. Some drift will likely occur in foliar, and less so by basal bark or injection method applications, and is greater in broadcast than by stem specific, selective treatments. Drift decreases as droplet size increases, or when granular from chemicals are used (VMFEIS -98). The method of foliar application in the treatment areas would be by backpack sprayer to selected individual stems only. After treatment, some relatively small quantities of herbicide could enter perennial streams in the project areas by surface flow during major storm events, or by movement in ephemeral channels, also during major storm events.

Key factors influencing peak concentrations are presence of stream buffer areas, storm intensity and duration, herbicide application rate and properties (mobility and persistence), soil type, distance from application point, depth of the water table and downstream mixing and dilution. Perennial, intermittent, and ephemeral streams would be protected by 100, 100 & 25-foot buffers respectively, within which no chemical herbicides would be applied. Herbicides might be able to move through the buffer, but are subject to dilution and mixing in transit. If an ephemeral stream is not buffered, herbicide may be detected in low concentration in stream flow soon after the first storm after treatment that is sufficient to create flow into nearby channels. No herbicide will be applied within 100 horizontal feet of lakes, wetlands, or perennial or intermittent streams

or within 100 horizontal feet of any public or domestic water source. Exclusion zones will be clearly marked before herbicide application so applicators can easily see and avoid them.

Storms with significant rainfall rarely produce anything more than low herbicide concentrations in streams because the active ingredient is diluted by a factor of the volume of water received in an area. Lesser storms, on the other hand, will usually not produce sufficient flow to move the chemical into a nearby stream. Storms of medium intensity and/or of relatively long duration will result in the highest detectable stream concentrations (VMFEIS Appendix C, Vol. II, C-1 thru C-24).

Entry of herbicides into ground water is described in the Risk Assessment, (VMFEIS Vol. II, Appendix A), and by Neary and Michael (VMFEIS Vol. II, Appendix C). After treatment, herbicides may move into aquifers by vertical seepage. In order to be considered to have polluted ground water, herbicide must occur at concentrations high enough to render water quality unsuitable for human use, or to injure or kill aquatic plants or animals.

The potential for herbicide concentration in ground water is proportional to application rate. The rates proposed for use in this project are less than the manufacturer's recommended label rate. The selective treatment method which targets individual tree stems, or small clumps, further reduces application rate another 50-90 percent below what can be expected under general broadcast methods and manufacturer's rates (VMFEIS, IV-101). When applied at the lowest effective rate, herbicides should not occur in ground water at concentrations exceeding the EPA's strictest drinking water standard. Deeper aquifers tapped by wells will have no presence or only negligible concentrations. Risk to ground water quality will remain minimal, in part, because the mitigation measures that are appropriate to apply in the treatment areas include the buffered, no treatment zone adjacent to all water sources (VMFEIS, Page IV-105).

The risk of glyphosate leaving the site is negligible because glyphosate binds tightly to the soil and has practically no leaching ability. Triclopyr has limited soil mobility and Imazapyr, which has some soil mobility in the spring, will be applied from late June through mid September when there is little to no evidence of soil mobility.

With the identified mitigation measures, the proposed activities would have no adverse direct effects to aquatic resources or aquatic species by implementing this alternative.

Indirect Effects - Indirect effects will be reduced when the road and stream crossings are maintained. Less sediment will be delivered to the stream channel resulting in improved aquatic habitat and water quality.

Cumulative Effects - No ground disturbing projects have been implemented in the past 5 years in the project vicinity. No additional actions are currently proposed or expect to be proposed in the reasonably foreseeable future within the analysis area that would add to

the erosion and sedimentation currently occurring within the disturbed acres of the road template.

There are no known cumulative effect(s) from herbicide treatments outside of these watersheds because of the relatively short half-life of the specific herbicides. In addition, because an individual stem or sprout group treatment method would be used, the true net acres treated would be only a small percentage the total stand acreage (estimated between 5 & 10%). Since there are no expected effects on aquatic resources from current activities or this proposal, there would be no cumulative effects to aquatic resources.

Effects of Alternative 3

This alternative would include all the activities of Alternative 2 (proposed action) with two exceptions; 1) herbicides will not be used for site preparation, seedling release or eradication of invasive species; and 2) FS Road 143-A would be closed to regular traffic and used as a segment of the existing Davenport Mountain ATV Trail, after closure. Closure of the abandoned FS Road 143-A will result in an improvement in soil productivity on sections not used as a trail.

The effects of proposed activities on water in Alternative 3 would be about the same as stated in Alternative 2.

Element - Visual Quality

This section will disclose the effects from project activities on the Landscape Character and the Scenic Integrity Objective (SIO) as determined in the Forest Plan Revision using the Scenery Management System (SMS). The SMS makes use of scenic classes based on the relative value and importance of the landscape to the viewing public, on a scale of one through seven. Scenic classes were derived by combining the scenic attractiveness of the area (which includes landscape character and existing scenic integrity) with landscape visibility (which includes concern levels, distance zones, and travel way importance).

The bounds of analysis in this section will include effects of actions on the scenic quality from typical observer positions, including the secondary travel ways and any use areas within or nearby the project areas. The analysis will consider 10 years as the limit (bounds) of the analysis since most vegetation manipulation that causes visual contrasts in this area is largely subordinate to the viewer after this time period.

Existing Conditions

Currently, all project areas are visible from observer positions on travel ways or use areas that provide access to the recreating public. The travel ways that influence this project are as listed:

Georgia State Highway 325, a primary travel way

Lake Nottely, a primary Tennessee Valley Authority lake
Davenport Mountain OHV Trail, a secondary travel way

The landscape character goal envisioned for 7.E.1, Dispersed Recreation Areas is *natural appearing*. These areas receive moderate to high recreation use and are managed to provide the public with a variety of recreation opportunities in a setting that provides quality scenery, numerous trails and limited facilities. The management emphasis is to improve the settings for non-formal outdoor recreation in a manner that protects and restores the health, diversity, and productivity of the watersheds.

These areas will be managed to absorb moderate to high levels of use with minimal improvements while protecting soil, vegetation, and water resource conditions.

A visually appealing landscape is achieved by providing vista openings and park like stands in a diversity of vegetation species and age classes. Trails will be maintained, improved, or expanded to meet local demands, provided the local ecosystem is not negatively affected. Existing old fields and openings for wildlife may be present, maintained, and expanded.

Effects of Alternative 1 (No Action)

Direct Effects - If no action is taken conditions will remain as they are now.

Indirect Effects- If no action is taken these stands will continue to grow and mature. Desired Conditions for natural appearing landscape character would not be met in the white pine or Virginia pine plantations. The oak/shortleaf pine stands in this area would continue to degenerate from Southern Pine Beetle mortality and degrade the Scenic Integrity Objective of High. The Urban Interface would remain brushy and fire could occur at the property lines of homes interfacing the forest.

Cumulative Effects- The cumulative effects on these stands would be the continual degradation of the visual quality of the area, allowing maturation of the pine plantations, and moving the area away from a natural appearing landscape. Fire conditions at private property bordering the FS land would continue to remain uncertain with continued fuel buildup. The Davenport Mountain ATV Trail would continue to have safety problems, as it shares tread with FS System Road 143A.

Effects of Alternative 2 (Proposed Action)

- 1. Thinning of white pine plantations:** This activity will consist of commercially thinning approximately 257 acres of white pine plantations and the precommercial thinning of 90 acres of white pine plantations. The ages of these plantations range from 13 to 43 years. A timber sale will be used to thin these stands. If the younger pine stands are of commercial size when the project is implemented they will be thinned as part of the planned timber sale.

If they are not of commercial size, they will be mechanically thinned leaving the stems on site. Most of these stands are stocked at approximately 200 to 300 stems per acre. These stands will be thinned to approximately 60 to 80 stems per acre. This will create enough space to start converting these stands back to a mixed shortleaf pine and oak timber type. This conversion will involve periodic prescribed burning and interplanting of oak and shortleaf pine seedlings. Approximately 1 mile of temporary road will be required, utilizing existing, closed roads and portions of the OHV trail.

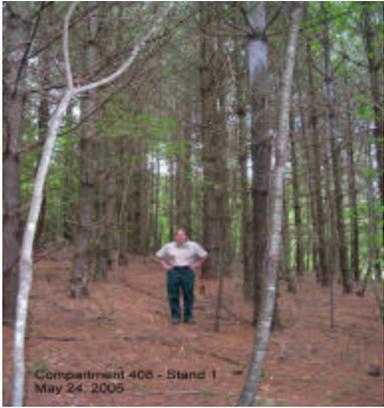


Table 6. DAVENPORT MOUNTAIN STEWARDSHIP PROJECT VISUAL INPUT for Scenic Class 1, High Scenic Integrity Objective for Commercial Thinning to Convert White Pine Stands to Shortleaf pine/oak stands

Area	Project	Area Use	Way	Level	Concern	Class	Scenic	SIO	Acres	Rx	for State	ment	Objectives
408749	408741	408714	408703	408701	Primarily	Secondary	1	H	7	7.E.1	Thinning	al	
					Primarily	Secondary	1	H	15	7.E.1	Thinning	ial	
					Primarily	Secondary	1	H	20	7.E.1	Thinning	ial	
					Primarily	Secondary	1	H	1	7.E.1	Thinning	ial	
					Primarily	Secondary	1	H	33	7.E.1	Thinning	ial	

Table 7. DAVENPORT MOUNTAIN STEWARDSHIP PROJECT VISUAL INPUT for Scenic Class 2, Moderate Scenic Integrity Objective for Commercial Thinning to Convert White Pine Stands to Shortleaf pine/oak stands

Area	Project	Area	Project	Area	Project	Area	Project	Area	Project	Area	Project	Area	Project
408740	325 Route 1025	408719	325 Route 1025	407706	325 Route 1025	407703	325 Route 1025	408734	325 Route 1025	416725	325 Route 1025	408731	325 Route 1025
	Primarily	Primarily	Primarily										
	2	2	2	2	2	2	2	1	1	1	1	1	1
	M	M	M	M	M	M	M	H	H	H	H	H	H
109	26	16	3	3	3	3	3	9	1	20	21	21	21
	7.E.1	7.E.1	7.E.1										
	Thinning	Thinning	Thinning										
	Commercial	Commercial	Commercial										
	White pine	White pine	White pine										

408740	325 Route 1025	408719	325 Route 1025	407706	325 Route 1025	407703	325 Route 1025	408734	325 Route 1025	416725	325 Route 1025	408731	325 Route 1025
	Primarily	Primarily	Primarily										
	2	2	2	2	2	2	2	1	1	1	1	1	1
	M	M	M	M	M	M	M	H	H	H	H	H	H
109	26	16	3	3	3	3	3	9	1	20	21	21	21
	7.E.1	7.E.1	7.E.1										
	Thinning	Thinning	Thinning										
	Commercial	Commercial	Commercial										
	White pine	White pine	White pine										

Table 8. DAVENPORT MOUNTAIN STEWARDSHIP PROJECT VISUAL INPUT for Scenic Class 1, High Scenic Integrity Objective for Non-Commercial Thinning to Convert White Pine Stands to Shortleaf pine/oak stands

Area	Project	Use	Level	Concern	Class	Scenic	SIO	Acres	Rx	Treatment	Stand	Objectives
416/10	Lake Road	Primary	Primary	H	1	1	H	6	7.E.1	Thinning	White pine	High scenic integrity
408/30	State Road	Primary	Secondary	H	1	1	H	10	7.E.1	Thinning	White pine	High scenic integrity
408/23	State Road	Primary	Primary	H	1	1	H	10	7.E.1	Thinning	White pine	High scenic integrity
408/16	State Road	Primary	Primary	H	1	1	H	8	7.E.1	Thinning	White pine	High scenic integrity
408/02	State Road	Primary	Primary	H	1	1	H	8	7.E.1	Thinning	White pine	High scenic integrity
78												

Table 9. DAVENPORT MOUNTAIN STEWARDSHIP PROJECT VISUAL INPUT for Scenic Class 2, Moderate Scenic Integrity Objective for Non-Commercial Thinning to Convert White Pine Stands to Shortleaf pine/oak stands

Area	Project	Use	Level	Concern	Class	Scenic	SIO	Acres	Rx	Treatment	Stand	Objectives
408/11	Trail	Secondary	Secondary	M	2	2	M	2	7.E.1	Thinning	White pine	Moderate scenic integrity
1												

Direct Effects- The basal area of the white pine plantations will be reduced. The potential for the spread of white pine into hardwood stands will be reduced. Shortleaf pine and oak will be inter-planted in these plantations after thinning. A more natural appearing landscape character will be promoted by these actions.

Indirect Effects - Restoration of oak/shortleaf pine timber types will begin in the openings created by the thinning of the white pine plantations. The area will take on a more natural appearing look as the solid blocks of white pine are broken into mixed stands. Survival of the hardwood and pine seedlings will be more successful with the use of herbicides for site preparation and release. Exotics will be more successfully controlled with the use of herbicides.

Cumulative Effects- There are few if any white pine plantations on adjacent lands. Thinning these stands on Davenport Mountain should make them more natural appearing, looking more like adjacent properties and surrounding areas. With the actions taken, these stands will blend with the overall vegetative composition of the Compartments and make the area more cohesive as a unit. Recreation would then occur in a setting that provides quality scenery.

- 2. Non-commercial thinning of Virginia pine plantation:** This activity will take place in Compartment 408, Stand 9 (44 acres). This stand was planted in 1990 with a Virginia pine and shortleaf pine mixture. In this stand, all Virginia pine would be removed leaving shortleaf pine with a stem density of approximately 40 trees per acre. The stand would be allowed to become a shortleaf pine/hardwood type. Oak seedlings would be planted if needed to fulfill the hardwood component of this stand. At the present time the Virginia pine trees are of no commercial value. If no market exists at the time of project implementation, the trees would be cut and left on site.

Table 10. DAVENPORT MOUNTAIN STEWARDSHIP PROJECT VISUAL INPUT for Scenic Class 1, High Scenic Integrity Objective for Conversion of Virginia Pine Plantation to Short Leaf Pine/Hardwood Type

Area/Project	Trail/Use	Secondary Use	Class/Scenic	SIO	Acres	Rx	for Stands	Virginia Objectives
408/09	Trail	Secondary	1	H	44	7.E.1	Commercial	type

Direct Effects- Virginia pine will be eliminated, encouraging the growth of shortleaf pine/hardwood type mixture in this stand.

Indirect Effects- Restoration of shortleaf pine/hardwood timber types will begin in the openings created by the elimination of the Virginia pine. The area will take on a more

natural appearing look as the solid blocks of Virginia pine are broken into mixed stands of pine/hardwood.

Cumulative Effects-There are few if any Virginia pine plantations on adjacent lands. Thinning these stands on Davenport Mountain should make them more natural appearing, looking more like adjacent properties and surrounding areas. This stand is in the middle of the project area. With the actions taken, the stand will blend with the overall vegetative composition of the Compartment and make the area more cohesive as a unit. Recreation would then occur in a setting that provides quality scenery.



3. Oak/ Shortleaf Pine Woodland Restoration: This activity will take place on approximately 390 acres in Compartment 416, stands 4-9,11-13,15, 20, 22, and, 23. The oak/shortleaf pine stands in this area have had repeated mortality from Southern Pine Beetle attacks and wind throw from Hurricane Opal in 1995. This area will be thinned and followed by periodic treatments of prescribed burning and herbicide as needed over the next ten years to help create an open oak-pine woodland community. Thinning would take place only on the upper and mid-slopes. Areas within these stands that are cove sites will not be thinned. Remnant shortleaf pines would be left in the thinned areas provide a seed source and to retain the representation of this important native species in the oak-pine ecosystem. Approximately 3/4 mile of temporary road will be required, utilizing existing, closed roads and portions of the OHV trail.

Table 11. DAVENPORT MOUNTAIN STEWARDSHIP PROJECT VISUAL INPUT for Scenic Class 1, High Scenic Integrity Objective for Thin & Prescription Burn

Area/Project	Area/Use/Way/Travel	or	Level/Concern	Class/Scenic	SIO	Acres	Rx	Burn/Thin & Rx for Stand/Segment	Pineland/Other/Stand/Interventions
416/04	Lake/Not/Travel		Primarily	1	H	3	7.E.1		

	416/23	416/22	416/20	416/16	416/13	416/12	416/11	416/09	416/08	416/07	416/06	416/05
	Lake											
	Primary											
	1	1	1	1	1	1	1	1	1	1	1	1
	H	H	H	H	H	H	H	H	H	H	H	H
390	13	27	30	72	8	7	8	33	2	50		
	7.E.1											
	Burn hin & Rx											
	Pine											
		rtleaf			e SPB/windrow							

Direct Effects- Pine Beetle/wind throw mortality trees will be eliminated, the area will be opened up to create an oak-pine woodland community.

Indirect Effects- The natural appearing landscape will be propagated through encouragement of important native species. The area will take on a more natural appearing look as fire returns in a natural role. Exotics will be more successfully controlled with the use of herbicides. It will show the local population what objectives can be accomplished through use of prescribed fire.

Cumulative Effects- This area would be representative of the native plant community found before extensive land development occurred in the area surrounding the lake. It will offer in time a view of a native appearing landscape. With the actions taken, the stands will blend with the overall vegetative composition of the Compartments and make the area more cohesive as a unit. Recreation would then occur in a setting that provides quality scenery.

4. Construction of firebreak in the Urban Interface: This activity would remove some of the fuel buildup adjacent to private property along approximately two miles of U.S. Forest Service boundary line on the southern edge of the Davenport Mountain tract. Most of this fuel consists of very thick young pine plantations adjacent to the private property. During the thinning operations mentioned in Activity 1 above logging slash would be pulled back 40 to 50 feet from the property boundary. If any of the stands near the property boundary are not of commercial size the material will be removed manually or processed by a chipper or mulcher and left on the site.

Table 12. DAVENPORT MOUNTAIN STEWARDSHIP PROJECT VISUAL INPUT for Scenic Class 1 and 2, High and Moderate Scenic Integrity Objective for Construction of fuel break in Urban Interface

Area	Project	Level	Scenic Class	SIO	Acres	Rx	Statement for Scenic Objectives
408 / 30 408 / 29 408 / 20 408 / 19 408 / 17 408 / 11	Roundabout	Primary	1	H	16	7.E.1	Urban interface
		Primary	1	H	7	7.E.1	
		Primary	2	M	26	7.E.1	
		Primary	2	M	7	7.E.1	
		Primary	2	M	16	7.E.1	lands
		Secondary	2	M	12	7.E.1	

4087132 408731	Roundabout	Primary Primary	1	H	21	7.E.	Like a park	Urban interface fire break in
			1	H	1	7.E.		
					131			

Direct Effects- Private property adjacent to the forest will be protected from sudden fire event on FS land. This will lend itself to a more natural appearing landscape character, and promote a good neighbor atmosphere.

Indirect Effects- The concept of fire protection in areas adjacent to the National Forest will be promoted. It will show the local population what objectives can be accomplished through use of fire prevention techniques.

Cumulative Effects- A visually appealing landscape will be achieved and can be maintained to provide a fire break in the Urban Interface. It will offer in time a view of a native appearing landscape in a park-like setting.

An example of such work is found below. The example was taken from the Oconee District.



The above example is from an Eatonton (Oconee District) loblolly pole timber stand. The before photo shows growth buildup and after shows the result of thinning, mulching and chipping cleanup.

5. Fish and Wildlife Improvement and Invasive Species Projects: This includes construction of fish attractors/cover in Lake Nottely, renovation of existing wildlife openings on the Brown Tract and the Davenport Tract, and targeted control of non-native invasive species.

Direct Effects- The renovation of existing wildlife openings will continue to provide diversity of vegetation in the area. The predominant landscape is natural appearing, but existing old fields and openings for wildlife may be present, maintained, and expanded.

Indirect Effects- Native species are emphasized when establishing food plants for wildlife. This will be helped along by the control of non-native invasive species that have become established in the project area.

Cumulative Effects- The emphasis of the 7.E.1 Dispersed Recreation Area is to improve settings for non-formal outdoor recreation, which both the fish attractors and wildlife openings will do. Long term the area will return to a more complete set of activities for the dispersed recreation, not just OHV trail riding opportunities.

6. Relocation of ATV Trail: The section of The Davenport Mountain ATV Trail that runs concurrent with System Road 143A would be relocated for safety and to avoid user conflicts between ATV's and full size vehicles. A new section of ATV trail would be constructed paralleling System Road 143A and would be approximately ½ mile long.

Table 13. DAVENPORT MOUNTAIN STEWARDSHIP PROJECT VISUAL INPUT for Scenic Class 1, High Scenic Integrity Objective for Relocation of Davenport Mountain ATV Trail

Area	Project	Level of Concern	Class	SIO	Acres	Rx	Statement
Lake	416/28	Primary	1	H	13	7.E.1	Construction
Lake	416/28	Primary	1	H	7	7.E.1	Construction
Lake	416/12	Primary	1	H	33	7.E.1	Construction
Lake	416/07	Primary	1	H	3	7.E.1	Construction
Lake	416/06	Primary	1	H	50	7.E.1	Construction
Lake	416/05	Primary	1	H	3	7.E.1	Construction
Lake	416/03	Primary	1	H	3	7.E.1	Construction
					172		

Direct Effects- Safety concerns will be lessened along the Davenport Mountain ATV Trail.

Indirect Effects- Soil and water movement from rains will be directed away from rutting situations along the trail.

Cumulative Effects - The settings for formal outdoor recreation will be improved to protect and restore the health, diversity, and productivity of the watershed.

7. Reforestation of Southern Pine Beetle Damaged Stands: This activity will include the site preparation and planting of two stands that were killed by southern pine beetle attacks. Stand 32 (12 acres) of Compartment 408 and Stand 24 (7 acres) of 416 will be planted with shortleaf pine and white oak seedlings. Chainsaws, prescribed burning and/or herbicides will be used in preparing these stands for planting. These seedlings will be released if needed, using herbicides after 1 to 3 years of planting.

Table 14. DAVENPORT MOUNTAIN STEWARDSHIP PROJECT VISUAL INPUT for Scenic Class 1, High Scenic Integrity Objective for Reforestation SPB

Area	Project	Area Use	Way	Use	Way	Class	SIO	Acres	Rx	for	Objectives
						Scenic				Statement	
408/32		Primary	Primary	Primary	Primary	1	H	12	7.E.1	Restoration	High Scenic Integrity Objectives
416/24		Primary	Primary	Primary	Primary	1	H	7	7.E.1	Restoration	High Scenic Integrity Objectives
								19			

Direct Effects- Pine Beetle mortality trees will be eliminated, the area will be opened up to create a short leaf pine and white oak woodland community.

Indirect Effects- The natural appearing landscape will be propagated through encouragement of important native species. The area will take on a more natural appearing look as fire returns in a natural role. Exotics will be more successfully controlled with the use of herbicides. It will show the local population what objectives can be accomplished through use of prescribed fire.

Cumulative Effects- This area would be representative of the native plant community found before extensive land development occurred in the area surrounding the lake. It will offer in time a view of a native appearing landscape. With the actions taken, the stands will blend with the overall vegetative composition of the Compartments and make the area more cohesive as a unit. Recreation would then occur in a setting that provides quality scenery.

Effects of Alternative 3

This alternative would include all the activities listed in Alternative 2 above with the following exceptions: (1) Herbicides will not be used for site preparation, release of seedlings or eradication of fescue and other invasive species listed in Activity 5 of Alternative 2 above. Other means of control such as prescribed burning or manual methods (chainsaws) would be used. (2) Instead of rerouting the section of ATV trail that follows FS System Road 143A, this road would be closed to regular vehicular traffic and left as an ATV trail only.

Direct Effects- The direct effects will be the same as in Alternative 2 above, except herbicides will not be used.

Indirect Effects- The indirect effects will be the same as in Alternative 2 above.

Cumulative Effects- The cumulative effects will be the same as in Alternative 2 above, except the visual effects may be slower to be noticed as the transition from one type of vegetation (plantations) to more natural appearing vegetation takes a longer time period.

Element - Cultural Resources

Existing Condition - Heritage resources are areas containing remnants of past human behavior that provide information about how people used and adapted to their environment over time. The Chattahoochee-Oconee is rich with heritage resources that provide a vast information base on the history and prehistory of northern Georgia. These resources range from 10,000-year-old artifacts to CCC camps of the 20th century. All heritage resources are fragile and non-renewable, meaning they cannot be rebuilt or remade. Once damaged, the information they contain becomes irretrievable (Forest Plan).

On the Chattahoochee National Forest, both prehistoric and historic sites may be found on flat ridges, saddles and gaps, upland flats and knolls, stream and river bottoms, terraces and benches, coves, and at the confluences of streams. Site types reflect man's major activities from stone tool and pottery making through farming and mining, over the past 10,000 years. The prehistory and history of the Chattahoochee National Forest can be found in the 1994 Cultural Resources Overview for the forest (Wynn et al., 1994). Also, this background can be found in the new 2004 Forest Land and Resource Management Plan and Environmental Impact Statement for the Chattahoochee-Oconee

National Forests (EIS 3-525) and previous reports noted below for the specific area around Davenport Mountain.

Our knowledge of the cultural resources within the Davenport area comes from previous surveys and previously recorded sites in the area as well as recent surveys for this particular project. Four previous surveys in the area have resulted in four sites recorded (Wynn 1988, Bruce 1993, Bruce 1998, Bruce 2001). In consultation with the SHPO, one site has been determined potentially eligible and one unknown for the National Register of Historic Places (NRHP). During this current survey for this project, 15 sites were recorded. Nine are recommended as not eligible for the National Register, five are recommended as unknown and future protection until further work can determine eligibility, and one is not evaluated since it is on TVA property. These sites will be identified and marked in the field prior to any ground disturbing activity.

The cultural resources issues concerning the Davenport Stewardship Project include:

1. Identification of all sites within the proposed stands
2. Protection of any National Register eligible sites
3. Archeological site monitoring along the ATV trail
4. Illegal trails or user-created trails through or across sites

Bounds of Analysis: Spatial: - This project will take place in the Davenport Mountain Area of Union County. This peninsula is approximately 1,100 acres in size that juts out into Nottely Lake. The project plans to examine approximately 800 acres of National Forest. **Temporal:** The time frame for this project is approximately 10 years. Monitoring of protected sites will continue after project completion as part of the Forest's heritage resources management.

Effects of Alternative 1 (No action)

None of the proposed activities would take place. There is potential for heritage resources to be damaged by unplanned fire suppression activities due to fuel buildup.

Effects of Alternative 2 (Proposed Action)

Direct Effects – This alternative has the potential to effect heritage resources by ground disturbing activities. Commercial and non-commercial activities by mechanical means could impact heritage resources by disturbing intact cultural deposits. Relocation of the ATV trail and preparation of prescribed burn areas (control lines) pose the same risk.

The potential for effects has been mitigated to an acceptable level by implementation of the standards in the current Land and Resource Management Plan, and identification and evaluation of historic properties, and mitigation measures established in consultation with the Georgia State Historic Preservation Officer. Historic properties eligible for or listed on the NRHP, including a protective buffer will be marked on the ground and avoided during project work.

Indirect Effects – Areas of ground disturbance by commercial and non-commercial activities by mechanical means; relocation of the ATV trail; and preparation of prescribed burn areas have the potential to cause erosion and exposure of sites.

The potential for effects has been mitigated to an acceptable level by implementation of the standards in the current Land and Resource Management Plan and identification and evaluation of historic properties, and mitigation measures established in consultation with the Georgia State Historic Preservation Officer. Additionally, thinning and prescribed fire activities to reduce fuel buildup would reduce the potential for impact to historic properties by unplanned suppression activities of wildfires. Historic properties eligible for or listed on the NRHP, including a protective buffer, will be marked on the ground and avoided during project work.

Cumulative Effects – The combined effect of past, present, and future Forest Service activities is the ever-growing identification and protection of cultural resource sites, and reports available to the scientific community. This information is necessary to provide an understanding of the natural and cultural history of the Forest in order to develop desired future conditions and to make informed land management decision and resource allocation.

Effects of Alternative 3

Direct Effects – This alternative has the potential to effect heritage resources by ground disturbing activities. Commercial and non-commercial activities by mechanical means could impact heritage resources by disturbing intact cultural deposits. Relocation of the ATV trail and preparation of prescribed burn areas (control lines) pose the same risk.

The potential for effects has been mitigated to an acceptable level by implementation of the standards in the current Land and Resource Management Plan, and identification and evaluation of historic properties, and mitigation measures established in consultation with the Georgia State Historic Preservation Officer. Historic properties eligible for or listed on the NRHP, including a protective buffer will be marked on the ground and avoided during project work.

Indirect Effects – Areas of ground disturbance by commercial and non-commercial activities by mechanical means; relocation of the ATV trail; and preparation of prescribed burn areas have the potential to cause erosion and exposure of sites.

The potential for effects has been mitigated to an acceptable level by implementation of the standards in the current Land and Resource Management Plan and identification and evaluation of historic properties, and mitigation measures established in consultation with the Georgia State Historic Preservation Officer. Additionally, thinning and prescribed fire activities to reduce fuel buildup would reduce the potential for impact to historic properties by unplanned suppression activities of wildfires. Historic properties eligible for or listed on the NRHP, including a protective buffer, will be marked on the ground and avoided during project work.

Cumulative Effects – The combined effect of past, present, and future Forest Service activities is the ever-growing identification and protection of cultural resource sites, and reports available to the scientific community. This information is necessary to provide an understanding of the natural and cultural history of the Forest in order to develop desired future conditions and to make informed land management decision and resource allocation.

BIOLOGICAL ENVIRONMENT

This section discloses effects to biological elements of the environment expected as a result of implementing the Proposed Action or alternatives. The biological environment includes the diversity of plant and animal communities, habitat components, and individual species of concern or interest. Analysis of effects to these elements is organized in this document following the framework used during forest planning (Forest Plan and FEIS). Use of this framework is designed to ensure comprehensive consideration of effects to the biological environment. Elements in this framework are listed in Table 15, where they are assessed for their relevance to this project. Only those relevant to the project are analyzed further in this document.

Table 15. Elements of the biological environment, derived from forest plan analysis, their relevance to the Davenport Mountain project, and whether they will be further analyzed in this document.		
Biological Element	Analyzed Further?	Relevance to this Project (Potential Effects of Concern)
MAJOR FOREST COMMUNITIES		
Mesic Deciduous Forests	Yes	Tree thinning and prescribed burning under some alternatives could change structure in existing mesic deciduous forest, also potentially affecting habitat abundance for associated species.
Eastern Hemlock and White Pine Forests	Yes	Tree thinning and prescribed burning under some alternatives would change structure in existing white pine plantations, also potentially affecting habitat abundance for associated species.
Oak and Oak-Pine Forests	Yes	Tree thinning and prescribed burning under some alternatives would change structure in existing oak and oak-pine forests, also potentially affecting habitat abundance for associated species.
Pine and Pine-Oak Forests	Yes	Tree thinning and prescribed burning under some alternatives would change structure in existing pine and pine-oak forests, also potentially affecting habitat abundance for associated species.
Mixed Woodlands, Savannas, and Grasslands	Yes	Tree thinning and prescribed burning under some alternatives would begin the development of woodland conditions that currently are absent from the area.
RARE COMMUNITIES		
Wetlands	No	Surveys of affected areas indicate no wetlands are present.
Glades and Barrens	No	Surveys of affected areas indicate no glades or barrens are present
Canebrakes	No	Surveys of affected areas indicate no canebrakes are present

Caves and Mines	No	Surveys of affected areas indicate no caves or mines are present
Table Mountain Pine	No	Surveys of affected areas indicate no table mountain pine forests are present
Rock Outcrops and Cliffs	No	Surveys of affected areas indicate no rock outcrops or cliffs are present
High Elevation Balds	No	Surveys of affected areas indicate no high elevation are present
Basic Mesic Forests	No	Surveys of affected areas indicate no basic mesic are present
SUCCESSIONAL STAGE HABITATS		
Successional Forests	Yes	Reforestation activities under some of the alternatives could change the abundance of the various forest successional stages.
High-Elevation, Early Successional Forests	No	The project area is less than 2400 feet in elevation and therefore does not provide high elevation conditions.
Old Growth	Yes	There is no existing old growth in the project, but thinning and prescribed burning under some of the alternative could affect future old growth
Forest Interior Birds	Yes	Tree thinning and prescribed burning under some alternatives could change habitat conditions for interior forest birds
Permanent Openings, Old Fields, Rights-of Way, Improved Pastures	Yes	Proposed management under some of the alternatives will change the condition of the existing permanent openings, also potentially affecting habitat abundance for associated species.
SPECIAL HABITAT ATTRIBUTES		
Riparian Habitats	Yes	Tree thinning and prescribed burning under some alternatives would change structure in forested riparian habitats, also potentially affecting habitat abundance for associated species
Snags, Dens, and Downed Wood	Yes	Prescribed burning and reforestation treatments under some alternatives may also result in both loss and creation of snags. Changes in snag density would potentially affect abundance and quality of habitat for snag-dependent species.
Aquatic Habitats	Yes	Tree thinning and prescribed burning under some alternatives could affect aquatic habitat conditions
THREATENED, ENDANGERED, SENSITIVE AND LOCALLY RARE SPECIES		
DEMAND SPECIES		
Black Bear	No	Black bear are not typically found within the area affected by this project due to the relative small, isolated nature of the forested tracts in this area and the amount of developed private land surrounding these tracts.
White-tailed Deer	Yes	Tree thinning, prescribed burning and permanent opening management under some alternatives would affect the amount of browse and cover for this species, potentially affecting population levels and hunter success.

The Forest Plan identifies 15 management indicator species to help indicate effects of management on some elements of this framework. A subset of these MIS is analyzed further in this analysis because their populations or habitats may be affected by the

project (Table 16). For those species that also were MIS in the original 1985 Forest Plan (e.g. Acadian flycatcher, pileated woodpecker, white-tailed deer, black bear), much of the Forest-wide population and habitat data was compiled and analyzed previously (USDA Forest Service 2003). Most of the MIS in the revised Forest Plan are birds that are monitored annually through the Forest's breeding bird surveys (USDA Forest Service 2004c). Population trends for all of the current MIS are summarized in the March 2005 Management Indicator Species Population Trend Report for the Chattahoochee-Oconee National Forests (USDA Forest Service 2005).

Table 16. Forest-level management indicator species, their purpose, whether they are selected for project-level analysis, and reasons for their selection or non-selection, Davenport Mountain Project			
Species Name	Purpose	Analyzed Further?	Relevance to this Project (Potential Effects of Concern)
Prairie Warbler	To help indicate the effects of management on early successional forests	Yes	Prairie warblers occur in the vicinity of the project and management actions may affect the availability of early successional forest
Ovenbird	To help indicate the effects of management on Forest Interiors (Chattahoochee NF)	Yes	Ovenbirds occur in the vicinity of the project and management actions may affect the forest interior habitat
Wood Thrush	To help indicate the effects of management on Forest Interiors (Oconee NF)	No	Wood thrush was selected as a MIS for the Oconee NF, to help indicate the effects of management actions on forest interior habitat. The Ovenbird is used as the MIS for this habitat on the Chattahoochee NF.
Pileated woodpecker	To help indicate effects of management on snags.	Yes	Pileated woodpeckers occur in the vicinity of the project and management actions may affect the availability of snags.
Scarlet Tanager	To help indicate the effects of management on Oak Forest	Yes	Scarlet Tanagers occur in the vicinity of the project and management actions may affect the structure of oak forests
Hooded Warbler	To help indicate the effects of management on mid -late successional mesic deciduous forest	Yes	Hooded warblers occur in the vicinity of the project and management actions may affect the structure of mid-late successional mesic deciduous forests
Chestnut-sided Warbler	To help indicate the effects of management on high elevation early-successional Forests	No	Chestnut-side warblers are unlikely to be found in the project area since it less than 2400 feet in elevation and therefore does not provide high elevation conditions.
Pine Warbler	To help indicate the effects of management on Pine, Pine-Oak Forest	Yes	Pine warblers occur in the vicinity of the project and management actions may affect the structure of pine forests.
Acadian Flycatcher	To help indicate the effects of management on Mid-Late Successional Riparian Habitats	Yes	Acadian Flycatchers occur in the vicinity of the project and management actions may affect the structure of forested riparian habitats.
Field Sparrow	To help indicate the effects of management on woodland, savanna and grassland	Yes	Field sparrows occur in the vicinity of the project and management actions may affect the availability of woodland

	communities		conditions.
Swainson's Warbler	To help indicate the effects of management on early successional riparian forests (Oconee NF)	No	Swainson's Warbler was selected as a MIS for early successional riparian habitats on the Oconee NF, primarily canebrakes. Habitat for this species is not present in the project area.
Red-cockaded woodpecker	To help indicate effects of management on recovery of this endangered species, and on mid-late successional pine forest community. (Oconee NF)	No	Red-cockaded woodpecker was selected as a MIS for open pine forests on the Oconee NF and do not occur on the Chattahoochee NF
Smooth Coneflower	To help indicate effects of management on recovery of this endangered species.	No	On the Chattahoochee NF, smooth coneflower is known only to occur on the Chattooga Ranger District in Habersham and Stephens Counties.
Black bear	To help indicate effects of management on supplying public demand for bear hunting and viewing.	No	Black bear are not typically found within the area affected by this project due to the relative small, isolated nature of the forested tracts in this area and the amount of developed private land surrounding these tracts.
White-tailed Deer	To help indicate effects of management on supplying public demand for deer hunting and viewing.	Yes	Tree thinning, prescribed burning and permanent opening management under some alternatives would affect the amount of browse and cover for this species, potentially affecting population levels and hunter success.

MAJOR FOREST COMMUNITIES

Table 17 below displays the acres of each CISC forest type for the Davenport Mountain project area.

Table 17. Forest Type Distribution for the Davenport Mountain Project Area

Forest Types	Comp. 407		Comp. 408		Comp. 416		Total	
	Acres	%	Acres	%	Acres	%	Acres	%
03 (White Pine)	59.7	19	273.1	41	17.0	3	349.8	23
09 (White Pine-Cove Hardwood)	0		7.2	1	0		7.2	1
10 (White Pine-Upland Hardwood)	0		77.8	12	9.2	2	87.0	6
12 (Shortleaf Pine-Oak)	0		8.3	1	0		8.3	1
13 (Loblolly Pine-Hardwood)	0		0		31.5	6	31.5	2

16 (Virginia Pine-Oak)	27.3	9	0		0		27.3	2
32 (Shortleaf Pine)	0		22.2	3	22.9	4	45.1	3
33 (Virginia Pine)	16.2	5	43.9	7	0		60.1	4
44 (S. Red Oak-Yellow Pine)	0		0		39.0	7	39.0	2
47 (White Oak, Black Oak-Yellow Pine)	0		26.4	4	0		26.4	2
53 (White Oak, Red Oak-Hickory)	140.8	45	158.4	24	378.4	70	677.6	44
56 (Y.Poplar, White Oak, N.Red Oak)	0		22.9	4	45.5	8	68.4	4
59 (Scarlet Oak)	30	9	0		0		30.0	2
99 (Openings)	41.4	13	20.9	3	0		62.3	4
TOTALS	315.4	100	661.1	100	543.5	100	1520	100

Element - Mesic Deciduous Forests

Measure: Measure will consist of species composition, age and stem density (basal area) in the affected timber stands and effects on habitat conditions and populations of associated species from project activities.

Bounds of Analysis: Spatial: Compartment 407, 408, and 416 and adjacent private lands. **Temporal:** Approximately 10 years following implementation.

Existing Conditions

This forest community consists of cove hardwoods, which may include yellow poplar, white oak, northern red oak, basswood and ash (Forest Type 56) and the more mesic of the upland hardwood stands (Forest Type 53). Cove hardwood forest types exist in three stands totaling 68 acres of the project area. Ages of these stands range from 26 to 77 years old. Basal area ranges from 60 to 100ft² or approximately 50 to 150 stems per acre. There are approximately 678 acres of upland hardwoods in the project area. However only a small proportion of these stands are located on mesic sites (north aspect, riparian corridor). The majority is located on xeric sites and is included in the oak and oak-pine forest community.

The revised Forest Plan identified the hooded warbler as a MIS to help indicate the effects of management on species associated with mature mesic deciduous forests. Hooded warblers are found in mixed hardwood forests of beech, maple, hickory and oaks with a dense undergrowth (DeGraaf et al 1991). They nest in the understory of deciduous forests, and a dense shrub layer and scant ground cover are important (NatureServe 2005). Mature forests with a structurally diverse understory and midstory layers are favored. The Hooded Warbler is a common breeding bird on the Brasstown Ranger District and has been reported from Breeding Bird Surveys in the Davenport project area. Given the limited availability of mature mesic deciduous forest habitat, population levels likely are moderate.

Effects of Alternative 1 (No Action)

Direct Effects - This alternative will perpetuate current conditions and no direct impacts to mature mesic deciduous forest habitat are expected. Existing habitat conditions for the hooded warbler and other species that utilize mature mesic deciduous habitats will be maintained.

Indirect Effects- Through time, the amount of mature mesic deciduous habitat will increase as the portions containing young forests mature. This should result in improved habitat conditions for the hooded warbler and other species that utilize mature mesic deciduous habitats.

Cumulative Effects - There is very little mesic deciduous forest type on private lands surrounding the Davenport Mountain area. Mature mesic hardwood forests also are somewhat limited on the Davenport Mountain Area but are abundant on the Forest as a whole. The revised Forest Plan has an objective to increase the structural diversity in mature mesic deciduous forests quantity and quality of these forests is expected to increase through the implementation of the Plan (USDA Forest Service 2004a). Bird survey data suggests that hooded warbler populations on the Forest have increased somewhat on the Forest over the last 10 years and populations are expected to increase on the Forest through the implementation of the revised Forest Plan (USDA Forest Service 2004a, 2005). There are no additional activities planned for the Davenport Mountain area that would affect the availability of mature mesic deciduous forests. Therefore no cumulative effects to mature mesic deciduous habitat and associated species such as hooded warblers are expected.

Effects of Alternative 2 (Proposed Action)

Direct Effects - There will be no tree cutting in the existing cove hardwood stands under this alternative. The only direct effect on these stands will be from prescribed burning. However, only a portion (less than 20 acres) of one of the cove hardwood stands is included in the prescribed burning block. The prescribed burn will be a backing fire with little impact on moist sites. The burning will take place during the dormant season with only the dead ground litter being consumed.

The majority of the thinning associated with the oak woodland restoration will occur on the drier upper and mid-slopes. However, a small portion of the mesic oak stands will be lightly thinned as part of the woodland restoration. The canopy gaps created by this activity will enhance structural diversity in these stands and will benefit hooded warblers and associated species.

If needed, herbicides also may be used to control competing vegetation in the portion of the stands within the woodland restoration area. In addition, where these stands adjoin existing roads, exotic species will be treated with herbicides on a limited basis in this alternative. There will be no direct effects of the herbicide application on hooded warblers or other mesic forest bird species. Hazard quotients (summarized in Appendix B, project folder) for small birds consuming contaminated insects are well below 1.0 for all herbicide applications proposed in this alternative indicating low risk, even at upper levels of exposure.

Existing habitat conditions for the hooded warbler and other species that utilize mature mesic deciduous habitats will be maintained and enhanced under this alternative.

Indirect Effects – Herbicide control of fire tolerant woody species and repeated prescribed burnings over time might result in the creation of a more open understory in a portion of the mesic deciduous stands. However only a small acreage of mesic deciduous hardwoods are included in the treatment unit and this will be offset by the understory development stimulated by the thinning of the mesic oak stands. Through time, the amount of mature mesic deciduous habitat will increase as the portions containing young forests mature. This should result in improved habitat conditions for the hooded warbler and other species that utilize mature mesic deciduous habitats.

Cumulative Effects - Most of the adjacent private property is being developed into residential areas. This is further reducing what little mesic forest there is in the adjacent area. Mature mesic hardwood forests also are somewhat limited on the Davenport Mountain Area but are abundant on the Forest as a whole. The revised Forest Plan has an objective to increase the structural diversity in mature mesic deciduous forests quantity and quality of these forests is expected to increase through the implementation of the Plan (USDA Forest Service 2004a). Bird survey data suggests that hooded warbler populations on the Forest have increased somewhat on the Forest over the last 10 years and populations are expected to increase on the Forest through the implementation of the revised Forest Plan (USDA Forest Service 2004a, 2005). There are no additional activities planned for the Davenport Mountain area that would affect the availability of mature mesic deciduous forests. Therefore no cumulative effects to mature mesic deciduous habitat and associated species such as hooded warblers are expected.

Effects of Alternative 3

Direct Effects - The direct effects of this alternative will be similar to Alternative 2. Because no herbicides will be used in this alternative, there will be more limited control of exotic species found within these stands. Control will be by manual means (cutting)

only. Existing habitat conditions for the hooded warbler and other species that utilize mature mesic deciduous habitats will be maintained and enhanced.

Indirect Effects – The indirect effects will be similar to Alternative 2. Through time, the amount of mature mesic deciduous habitat will increase as the portions containing young forests mature. This should result in improved habitat conditions for the hooded warbler and other species that utilize mature mesic deciduous habitats.

Cumulative Effects - The cumulative effects will be similar to Alternative 2. There are no additional activities planned for the Davenport Mountain area that would affect the availability of mature mesic deciduous forests. Therefore no cumulative effects to mature mesic deciduous habitat and associated species such as hooded warblers are expected.

Element - Eastern Hemlock and White Pine Forests

Measure - Measure will consist of species composition, age, and stem density (basal area) in the affected stand and effects on habitat conditions and populations of associated species from project activities.

Bounds of Analysis – Spatial: Compartment 407, 408, and 416 and adjacent private lands. **Temporal:** Approximately 10 years following implementation

Existing Conditions

This forest community on the project area consists mainly of white pine plantations and stands with white pine as a major component (Forest Types 03, 09, and 10). White pine forest types exist on 444 acres of the project area. Approximately 347 of these acres are in plantations with ages ranging from 13 to 43 years. Basal areas of these stands range from 80 to 140ft² or approximately 60 to 300 stems per acre. These plantations have a very dense canopy that doesn't allow much sunlight to reach the forest floor. As a result herbaceous growth is limited under these stands and it doesn't allow for any natural regeneration of oak or shortleaf pine. The remainder of the stands are in mixed white pine hardwood stands. There are no hemlock stands in the project area.

Effects of Alternative 1 (No Action)

Direct Effects - This alternative will perpetuate current conditions and no direct impacts to white pine forest habitat are expected.

Indirect Effects - If no action is taken the white pine plantations will continue to grow at a slow rate each year due to the high stem density. There will be little if any chance for oak or shortleaf pine to become established in these areas. As the white pines mature and start producing seed they will expand into the remaining hardwood stands around them.

Cumulative Effects - There are very few white pine stands on adjacent properties around the Davenport Mountain area. It is possible that as these plantations mature and start producing seed that white pine will spread onto adjacent lands.

Effects of Alternative 2 (Proposed Action)

Direct Effects - The basal area of 347 acres of white pine plantations will be reduced under this alternative. The potential for the spread of white pine into hardwood stands will be reduced. Shortleaf pine and oak will be interplanted in these plantations after thinning to begin the development of more natural species composition.

Indirect Effects - Restoration of oak/shortleaf pine timber types will begin in the openings created by the thinning of the white pine plantations. The area will take on a more natural appearing look as the solid blocks of white pine are broken into mixed stands. The use of herbicides for release will enhance the survival of the hardwood and pine seedlings. Exotics will be more successfully controlled with the use of herbicides.

Cumulative Effects - There are few if any white pine plantations on adjacent lands. Thinning these stands on Davenport Mountain should not have any effect on adjacent properties.

Effects of Alternative 3

Direct Effects - Direct effects will be similar to Alternative 2. The treatments will begin the development of more natural species composition in the existing white pine plantations.

Indirect Effects – Restoration of oak/shortleaf pine timber types will begin in the openings created by the thinning of the white pine plantations. However, without the use of herbicides for control of herbaceous and unwanted woody plants, survival of the pine and oak seedlings will be reduced in the interplanted areas.

Cumulative Effects – The cumulative effects of this alternative will be similar to Alternative 2.

Element - Oak and Oak-Pine Forests

Measure - Measure will consist of species composition, age and stem density (basal area) in the affected timber stands and effects on habitat conditions and populations of associated species from project activities.

Bounds of Analysis – Spatial: Compartment 407, 408, and 416 and adjacent private lands. **Temporal:** Approximately 10 years following implementation

Existing Conditions

This forest community consists of black oak, southern red oak, white oak, and scarlet oak with a lesser component of shortleaf pine (Forest Types 44, 47, 53, and 59). Most of the shortleaf pine in this area has been killed by southern pine beetle infestations. There are approximately 773 acres of oak and oak- pine stands in the project area that was formerly a mixture of mature shortleaf pine and oak. Over the last 30 years three different Southern Pine Beetle (SPB) outbreaks have removed most of the shortleaf pine from these stands. Hurricane Opal in 1995 further reduced the oak and pine component in these stands.

The revised Forest Plan identified the Scarlet Tanager as a MIS to help indicate the effects of management on species associated with mature upland oak communities. The scarlet tanager is most abundant in mature, upland deciduous forests (Hamel 1992). It is most common in areas with a relatively closed canopy, a dense understory with a high diversity of shrubs, and limited ground cover (NatureServe 2005). The majority of the Davenport Mountain consists of mature upland hardwood forests. The scarlet tanager is a common breeding bird on the Brasstown Ranger District and has been reported from Breeding Bird Surveys in the Davenport project area. Given the availability of mature upland oak forest habitat, population levels likely are moderate.

Effects of Alternative 1 (No Action)

Direct Effects - This alternative will perpetuate current conditions and no direct impacts to mature upland oak forest habitat are expected.

Indirect Effects - As the white pines in the adjoining stands mature and start producing seed they will expand into the remaining hardwood stands around them. In the remnant oak/shortleaf stands they will remain oak and other mixed hardwood timber types. White pine seedlings will become established in the understory from the expanding white pine plantations. Through time, the amount of mature upland oak habitat may decrease increase due to white pine encroachment. This may result in a decline in habitat quality for the scarlet tanager and other species that utilize mature upland oak habitats.

Cumulative Effects - Mature oak forest are abundant on the Davenport Mountain area and Forest as a whole. The availability of older oak stands on the Forest is expected to increase through the implementation of the revised Forest Plan (USDA Forest Service 2004a). Bird survey data suggests that scarlet tanager populations have been increased on the Forest during the last decade and populations are expected to increase on the Forest through the implementation of the revised Forest Plan (USDA Forest Service 2004a, 2005). There are no additional activities planned for the Davenport Mountain that would affect the availability of mature oak forests. Therefore no cumulative effects to mature upland oak habitat and associated species such as scarlet tanagers are expected.

Effects of Alternative 2 (Proposed Action)

Direct Effects – Under this alternative, approximately 342 acres of existing upland hardwood stands will be thinned and prescribed burned. Thinning will remove smaller

diameter hardwoods, Virginia and white pines, retaining the larger oaks and any remnant shortleaf pines. Herbicides will also be used to reduce sprouting of hardwoods and encroaching white pine. Thinning will be concentrated on the upper and mid-slopes. These treatments provide favorable conditions for oak and shortleaf pine regeneration and will help to begin the development of more open oak-pine woodland conditions. These treatments may result in less desirable habitat conditions for the scarlet tanager and other species that utilize mature, closed canopy upland oak habitats. However, only a portion of the oak stands in the project area will be affected by the woodland restoration treatments and these habitats are very abundant on the Forest.

There will be no direct effects of the herbicide application on scarlet tanagers or other species that utilize mature, closed canopy upland oak habitats. Hazard quotients (summarized in Appendix B, project folder) for small birds consuming contaminated insects are well below 1.0 for all herbicide applications proposed in this alternative indicating low risk, even at upper levels of exposure.

Indirect Effects – By providing favorable conditions, over time, the oak and shortleaf pine component will be increased in these upland hardwood stands. Oak/shortleaf pine timber types will begin to be reestablished where they formerly occurred.

Cumulative Effects - Most of the adjacent private property is being developed into residential areas. This is further reducing the oak and oak-pine forest communities in the project vicinity. The planned restoration of these plant communities on National Forest lands will be the only opportunity in this area for reestablishing this type ecosystem. Across the Forest, the availability of older oak stands is expected to increase through the implementation of the revised Forest Plan (USDA Forest Service 2004a). Bird survey data suggests that scarlet tanager populations have been increased on the Forest during the last decade and populations are expected to increase on the Forest through the implementation of the revised Forest Plan (USDA Forest Service 2004a, 2005). There are no additional activities planned for the Davenport Mountain that would affect the availability of mature oak forests. Therefore no cumulative effects to mature upland oak habitat and associated species such as scarlet tanagers are expected.

Effects of Alternative 3

Direct Effects - Direct effects will be similar to Alternative 2. These treatments provide favorable conditions for oak and shortleaf pine regeneration and will help to begin the development of more open oak-pine woodland conditions. These treatments may result in less desirable habitat conditions for the scarlet tanager and other species that utilize mature, closed canopy upland oak habitats. However, only a portion of the oak stands in the project area will be affected by the woodland restoration treatments and these habitats are very abundant on the Forest.

Indirect Effects - Without using herbicides it will take longer to establish the oak/shortleaf pine component in the stands that are thinned due to competition from herbaceous plants as well as other hardwoods.

Cumulative Effects: The cumulative effects of this Alternative will be similar to Alternative 2. There are no additional activities planned for the Davenport Mountain that would affect the availability of mature oak forests. Therefore no cumulative effects to mature upland oak habitat and associated species such as scarlet tanagers are expected

Element - Pine and Pine-Oak Forests

Measure - Measure will consist of species composition, age and stem density (basal area) in the affected timber stand and effects on habitat conditions and populations of associated species from project activities.

Bounds of Analysis – Spatial: Compartment 407, 408, and 416 and adjacent private lands. **Temporal:** Approximately 10 years following implementation.

Existing Conditions

This forest community consists of yellow pine stands where 70% or greater of the dominant trees are yellow pine or pine-oak stands where yellow pine makes up 51% to 69% of the dominant trees (Forest Types 12,13 16, 32, 33). There are approximately 172 acres of pine and pine-oak forest types on the area. Yellow pine species include shortleaf, Virginia and loblolly. Most of the shortleaf stands are 60 years and older with the Virginia and loblolly stands being less than 35 years old.

The revised Forest Plan identified the pine warbler as a MIS to help indicate the effects of management on species associated with pine and pine-oak forests. The pine warbler uses mid to late successional pine forests throughout the year. (Hamel 1992). It occurs in both open pine woodlands and dense pine plantations, but seldom uses hardwood stands. The highest numbers seem to occur where pure stands of pine are found. It is less abundant as the proportion of hardwood tree species increases (NatureServe 2005). The pine warbler is a common breeding bird on the Brasstown Ranger District and has been reported from Breeding Bird Surveys in the Davenport project area. Given the limited availability of mid-late successional pine and pine-oak forest habitat, population levels likely are low to moderate.

Effects of Alternative 1 (No Action)

Direct Effects - This alternative will perpetuate current conditions and no direct impacts to pine and pine-oak forest habitat are expected. The dead loblolly stand will become a mixed stand of sourwood, dogwood, hickory and some oak species.

Indirect Effects- Through time, the amount of mature pine and pine-oak habitat will increase as the portions containing young forests mature. However, over time they will decline in the project area because of a lack of prescribed burning which will limit regeneration. Future attacks from southern pine beetle and encroachment from white pines and hardwoods will help to further reduce shortleaf pine and pine/oak stands in the

project area. This should result in a decline in habitat conditions for the pine warbler and other species that utilize mature pine forest habitats.

Cumulative Effects - Shortleaf pine stands will decline in the surrounding area because of the increase in urbanization and a lack of prescribed burning on private lands. Private ownership in the surrounding area is made up of individually owned small blocks that cannot be feasibly burned. Residential development in the urban interface will continue to remove portions of remaining shortleaf pine in the area. Southern Pine Beetle mortality on private lands has also reduced the shortleaf component in adjacent areas. Mature pine forests are somewhat limited on the Davenport Mountain area but are abundant on the Forest as a whole. The availability of older pine stands on the Forest has increased over the last few decades. However, recent outbreaks of Southern Pine beetle have reduced the availability of these habitats on some portions of the Forest. The availability of older pine stands on the Forest is expected to increase through the implementation of the revised Forest Plan (USDA Forest Service 2004a). Bird survey data suggests that pine warbler populations have been relatively stable on the Forest and populations on the Forest are expected to increase through the implementation of the revised Forest Plan (USDA Forest Service 2004a, 2005). There are no additional activities planned for the Davenport Mountain area that would affect the availability of mature pine forests. Therefore no cumulative effects to pine and pine-oak forest habitat and associated species such as pine warblers are expected.

Effects of Alternative 2 (Proposed Action)

Direct Effects – Approximately 48 acres of pine and pine/oak stands will be thinned leaving the dominant pines in these stands. This will increase vigor in the remaining trees and increase their resistance to southern pine beetle attacks. The prescribed burning will help to promote regeneration in the pine stands after thinning. Using herbicides will help keep the competing hardwood sprouts in check. These activities also will result in improved habitat conditions for the pine warbler and species that utilize mature pine forests.

There will be no direct effects of the herbicide application on pine warblers or other songbirds that utilize mature pine forests. Hazard quotients (summarized in Appendix B, project folder) for small birds consuming contaminated insects are well below 1.0 for all herbicide applications proposed in this alternative indicating low risk, even at upper levels of exposure.

Indirect Effects - Over time with these treatments pine should remain a major component in these stands. The younger pine stands will continue to mature into more open stands with less hardwood component.

Cumulative Effects - Most of the adjacent private property is being developed into residential areas. This is further reducing the pine and pine/oak timber communities in the project area. Southern Pine Beetle mortality on private lands has also reduced the shortleaf pine component in adjacent areas. The planned restoration of these plant

communities on National Forest lands will be the only opportunity in this area for reestablishing this type ecosystem. The availability of older pine stands on the Forest is expected to increase through the implementation of the revised Forest Plan (USDA Forest Service 2004a). Bird survey data suggests that pine warbler populations have been relatively stable on the Forest and populations on the Forest are expected to increase through the implementation of the revised Forest Plan (USDA Forest Service 2004a, 2005). There are no additional activities planned for the Davenport Mountain area that would affect the availability of mature pine forests. Therefore no cumulative effects to pine and pine-oak forest habitat and associated species such as pine warblers are expected.

Effects of Alternative 3

Direct Effects – The direct effects will be similar to Alternative 2. The pine and pine/oak stands will be thinned leaving the dominant pines in these stands. This will increase vigor in the remaining trees and increase their resistance to southern pine beetle attacks. The prescribed burning will help to promote regeneration in the pine stands after thinning. These activities also will result in improved habitat conditions for the pine warbler and species that utilize mature pine forests.

Indirect Effects - Without using herbicides it will take longer to establish the pine and pine/oak component in the stands that are thinned due to competition from herbaceous plants as well as other hardwoods. The costs to release the seedlings will be higher if they are released with manual means.

Cumulative Effects – The cumulative effects of this alternative will be similar to Alternative 2. There are no additional activities planned for the Davenport Mountain area that would affect the availability of mature pine forests. Therefore no cumulative effects to pine and pine-oak forest habitat and associated species such as pine warblers are expected.

Element - Mixed Woodlands, Savannas, and Grasslands

Measure - Measure will consist of species composition, age and stem density (basal area) in the affected timber stands and effects on habitat conditions and populations of associated species from project activities.

Bounds of Analysis – **Spatial:** Compartment 407, 408, and 416 and adjacent private lands. **Temporal:** Approximately 10 years following implementation

Existing Conditions

Woodlands, grasslands, and savannas were once a frequent occurrence across the southeastern landscape on xeric ridge-tops and south-facing slopes (USDA Forest Service 2004a). These fire-maintained communities were characterized by sparse tree cover and a well-developed, herbaceous understories. At the present time there are not any

woodland or savanna forest communities in the project area. There are currently 25 acres of grasslands that are maintained as permanent wildlife openings (see Permanent Openings Section). The revised Forest Plan identifies the field sparrow to help indicate the effects of management on species associated with woodland, savanna, and grassland communities. It is associated with scattered saplings or shrubs in tall weedy or herbaceous cover (Hamel 1992). Field sparrows are relatively uncommon on the Brasstown Ranger District and have not been reported from Breeding Bird Surveys in the Davenport Mountain project area. Given the lack of woodland, grassland, and savanna habitat, population levels likely are very low.

Effects of Alternative 1 (No-Action)

Direct Effects - This alternative will perpetuate current conditions and habitat conditions for field sparrows and other species associated with woodland, savanna, and grassland habitats will remain extremely limited.

Indirect Effects - This alternative will perpetuate current conditions and habitat conditions for field sparrows and other species associated with woodland, savanna, and grassland habitats will remain extremely limited.

Cumulative Effects - There are some open grasslands in the surrounding area in the form of pastures. Some of these are being converted into residential areas further reducing grasslands in the area. Woodland, grassland, and savanna habitat is extremely limited on the Davenport Mountain Area and the Forest as a whole. Across the Forest, the availability of these habitats is expected to increase with the implementation of the revised Forest Plan (USDA Forest Service 2004a). The revised plan has an objective of restoring 10,000 acres of open woodlands, savannahs, and grasslands on the Chattahoochee within the first 10 years of plan implementation (Objective 3.4). This would result in enhanced habitat conditions for field sparrows and other species associated with woodland, savanna, and grassland habitats.

Effects of Alternative 2 (Proposed Action)

Direct Effects - Under the proposed alternative there will be approximately 390 acres of oak/pine forest types thinned and periodically prescribed burned to begin to develop open oak/shortleaf pine woodland conditions. Herbicides will be used to control unwanted sprouts. This would result in enhanced habitat conditions for field sparrows and other species associated with woodland, savanna, and grassland habitats.

There will be no direct effects of the herbicide application on field sparrows or other grassland birds. Hazard quotients (summarized in Appendix B, project folder) for small birds consuming contaminated insects are well below 1.0 for all herbicide applications proposed in this alternative indicating low risk, even at upper levels of exposure.

Indirect Effects - Over time the above treatments will convert these stands into an open woodland forest community. These stands will have a basal area of approximately 30 to 60ft² with a stem density of 20 to 50 trees per acre.

Cumulative Effects - There are some open grasslands in the surrounding area in the form of pastures. Some of these are being converted into residential areas further reducing grasslands in the area. Woodland, grassland, and savanna habitat is extremely limited on the Davenport Mountain Area and the Forest as a whole. Across the Forest, the availability of these habitats is expected to increase with the implementation of the revised Forest Plan (USDA Forest Service 2004a). The revised plan has an objective of restoring 10,000 acres of open woodlands, savannahs, and grasslands on the Chattahoochee within the first 10 years of plan implementation (Objective 3.4). This would result in enhanced habitat conditions for field sparrows and other species associated with woodland, savanna, and grassland habitats. Developing these communities with this project will insure their continued existence in the surrounding area.

Effects of Alternative 3

Direct Effects – The direct effects of this alternative will be similar to Alternative 2. Approximately 390 acres of oak/pine forest types thinned and periodically prescribed burned to begin to develop open oak/shortleaf pine woodland conditions. This would result in enhanced habitat conditions for field sparrows and other species associated with woodland, savanna, and grassland habitats. Herbicides will not be used to control unwanted sprouts and herbaceous plants. This will be done manually which will cost more and will not be as effective.

Indirect Effects - Over time the above treatments will convert these stands into an open woodland forest community. These stands will have a basal area of approximately 30 to 60 with a stem density of 20 to 50 trees per acre.

Cumulative Effects – The cumulative effects of this alternative will be similar to Alternative 2. Across the Forest, the availability of woodland, savanna, and grassland habitats is expected to increase with the implementation of the revised Forest Plan (USDA Forest Service 2004a). Developing these communities with this project will insure their continued existence in the surrounding area.

SUCCESSIONAL STAGE HABITATS

Element - Successional Forests

Measure - Measure will consist of changes in age class distribution in the project area and effects on habitat conditions and populations of associated species from project activities.

Bounds of Analysis – Spatial: Compartment 407, 408, and 416 and adjacent private lands. **Temporal:** Approximately 10 years following implementation

Existing Conditions

The current age class distribution is listed in Table 18. Only two percent of the project area is less than ten years old. This consists of 19 acres in two stands that were killed by southern pine beetles. These stands will provide early successional habitat for the life of this project. Approximately 33 percent is in the sapling/pole stage (11-40 years old), approximately 40 percent is mid successional (41-80 years old), and 21 percent is late successional (80+ years of age). The remaining 4 percent is non-forested.

The revised Forest Plan identified the prairie warbler was selected as a MIS to help indicate the effects of management on species associated with early successional forests. Prairie warblers are shrubland nesting birds found in suitable habitats throughout the Southern Appalachians, Piedmont, and Coastal Plain (Hamel 1992). Prairie warblers require a dense forest regeneration or open shrubby conditions in a forest setting. Near optimal habitat conditions are characterized by regeneration, thinned areas or patchy openings 10 acres or more in size (Nature Serve 2004). Populations respond favorably to conditions created 3 to 10 years following regeneration in larger forest patches (Lancia et al. 2000). Prairie warblers occur through the Forest. The prairie warbler is a common breeding bird on the Brasstown Ranger District and has been reported from Breeding Bird Surveys in the Davenport project area. Prairie warbler populations likely are low on the Davenport Mountain area due to the limited availability of early successional habitats. Because the mid and late successional forest habitats support more divergent communities depending on their composition, management indicator species for these habitats are identified and analyzed under the individual major forest community sections above.

Effects of Alternative 1 (No Action)

Direct Effects - This alternative will perpetuate current conditions and no direct changes to the distribution of successional habitats are expected.

Indirect Effects- Through time, the amount of early successional habitat will decrease as these young forests mature. This should result in a reduction in the habitat availability for the prairie warbler and other species that utilize early successional habitats. Habitat for species associated with mid and late successional species will increase over time.

Cumulative Effects - Early successional habitat are limited on the Davenport Mountain area. This habitat is somewhat more common on the Forest as a whole but has declined recently due to a reduction in forest management activities. The availability of early successional habitat on the Forest is expected to increase through the implementation of the revised Forest Plan (USDA Forest Service 2004a). Bird survey data suggests that prairie warbler populations have been relatively stable on the Forest during the last decade (USDA Forest Service 2005). Populations are expected to increase on the Forest through the implementation of the revised Forest Plan (USDA Forest Service 2004a). There are no additional activities planned for the Davenport Mountain that would affect

the availability of early successional forests. Therefore no cumulative effects to early successional forest habitat and associated species such as prairie warblers are expected.

Effects of Alternative 2 (Proposed Action)

Direct Effects - There will be no direct changes in age class distribution under this alternative. The two existing early successional stands will site prepared with chainsaws and herbicides. Shortleaf pine and oak seedlings will be planted and later released with herbicides. The thinning proposed in both the white pine plantations and mature oak/shortleaf pine stands will result in the opening of the canopies in these stands. However, there will be an overstory left in the treated stands and the successional stage will distribution will be maintained. These canopy gaps will provide some limited improvement in habitat conditions for the prairie warbler and other species associated with early successional conditions. However, habitat availability for these species would remain limited.

There will be no direct effects of the herbicide application on prairie warblers or other early successional species. Hazard quotients (summarized in Appendix B, project folder) for small birds consuming contaminated insects are well below 1.0 for all herbicide applications proposed in this alternative indicating low risk, even at upper levels of exposure.

Indirect Effects - Through time, the amount of early successional habitat will decrease as these young forests mature. This should result in a reduction in the habitat availability for the prairie warbler and other species that utilize early successional habitats. Habitat for species associated with mid and late successional species will increase over time.

Cumulative Effects - Early successional habitat are limited on the Davenport Mountain area. This habitat is somewhat more common on the Forest as a whole but has declined recently due to a reduction in forest management activities. The availability of early successional habitat on the Forest is expected to increase through the implementation of the revised Forest Plan (USDA Forest Service 2004a). Bird survey data suggests that prairie warbler populations have been relatively stable on the Forest during the last decade (USDA Forest Service 2005). Populations are expected to increase on the Forest through the implementation of the revised Forest Plan (USDA Forest Service 2004a). There are no additional activities planned for the Davenport Mountain that would affect the availability of early successional forests. Therefore no cumulative effects to early successional forest habitat and associated species such as prairie warblers are expected.

Effects of Alternative 3

Direct Effects – The effects of this alternative will be similar to Alternative 2. There will be no direct changes in age class distribution under this alternative. The canopy gaps created by the proposed thinning will provide some limited improvement in habitat conditions for the prairie warbler and other species associated with early successional conditions. However, habitat availability for these species would remain limited.

Indirect Effects - Through time, the amount of early successional habitat will decrease as these young forests mature. This should result in a reduction in the habitat availability for the prairie warbler and other species that utilize early successional habitats. Habitat for species associated with mid and late successional species will increase over time.

Cumulative Effects – The cumulative effects of this alternative are similar to Alternative 2. There are no additional activities planned for the Davenport Mountain that would affect the availability of early successional forests. Therefore no cumulative effects to early successional forest habitat and associated species such as prairie warblers are expected.

Table 18. Current Age Class Distribution for the Davenport Mountain Project Area.

Age Class	Comp. 407		Comp. 408		Comp. 416		Total	
	Acres	%	Acres	%	Acres	%	Acres	%
0-10 years	9.3	3	11.7	2	6.8	1	27.8	2
11-20	14	4	200.2	30	6.4	1	220.6	15
21-30	45.7	14	107.10	17	126.4	23	279.2	17
31-40	0		7.2	1	9.2	2	16.4	1
41-50	16.2	5	120.6	18	10.6	2	147.4	10
51-60	0		114.6	17	33.3	6	147.9	10
61-70	0		34.7	6	22.8	4	57.5	4
71-80	85.10	27	22.9	3	137.2	25	245.2	16
81-90	14.0	5	21.2	3	0		35.2	2
91-100	80.6	26	0		127.3	24	207.9	14
101-110+	9.1	3	0		63.5	12	72.6	5
Non-Forested	41.4	13	20.9	3	0		62.4	4
TOTALS	315.4	100	661.1	100	543.5	100	1520	100

Element - Old Growth

Measure - Effects on habitat conditions and populations of associated species from project activities.

Bounds of Analysis – **Spatial:** Compartment 407, 408, and 416 and adjacent private lands. **Temporal:** Approximately 10 years following implementation

Existing Conditions

There are no stands in the project area that meet the minimum age for potential old growth based on the Region 8 Old-Growth Guidance (USDA Forest Service 1997). There are only 2 stands that are over 100 years of age. This includes an approximately 104 year-old Virginia Pine-Oak stand (Forest Type =16, Site Index =70) and an approximately 103 year-old upland hardwood stand (Forest Type=53, Site Index = 80). Based on forest type and site index, the minimum potential old-growth age for these stands are 120 and 130 year-old, respectively.

The Land and Resource Management Plan for the Chattahoochee National Forest states that in watersheds with more than 1000 acres of National Forest land, at least 5 percent of each 6th level HUC will be identified as small blocks of future old-growth and will be managed to protect their old-growth characteristics during the Plan cycle (FW-044). In the Davenport Mountain project area of 1520 acres, at least 76 acres set aside for future old growth. For the project area, the stands identified as small blocks of future old-growth include Compartment 407 Stands 1, 2 and 4 (61 acres) and the western portion of Stand 5 of Compartment 416 (30 acres). These stands are dry and dry-mesic pine-oak and dry-mesic oak old-growth communities. These stands range in age from 96 to 104 years-of-age.

Effects of Alternative 1 (No Action)

Direct Effects - This alternative will perpetuate current conditions and no direct effects to potential old-growth habitats are expected.

Indirect Effects - With no action, through time some of the older stands will reach minimum old growth age and begin to develop old-growth conditions.

Cumulative Effects – Little, if any old growth forest exists on private lands surrounding Davenport Mountain. There are no stands in the Davenport Mountain project area that meet the minimum age for potential old growth and no treatments are planned in the stands identified as future old growth. On the Forest, there are approximately 45,000 acres of possible old-growth (USDA Forest Service 2004a Table 3-83). These are stands that meet the minimum age for potential old growth. In addition, the revised Forest Plan allocates approximately 169,000 acres of the Chattahoochee NF to old-growth and old-growth compatible management prescriptions (USDA Forest Service 2004a Table 3-85). This is approximately 23 percent of the Forest acres. There are no activities planned for

the Davenport Mountain that would affect the availability or development of old-growth forests. Therefore no cumulative effects to old-growth habitat are expected.

Effects of Alternative 2 (Proposed Action)

Direct Effects - No treatments are planned in the stands identified as future old growth. These stands will be managed to protect their old-growth characteristics during the Plan cycle.

Indirect Effects - Through time some of the older stands will reach minimum old growth age and begin to develop old-growth conditions.

Cumulative Effects - Little, if any old growth forest exists on private lands surrounding Davenport Mountain. There are no stands in the Davenport Mountain project area that meet the minimum age for potential old growth and no treatments are planned in the stands identified as future old growth. On the Forest, there are approximately 45,000 acres of possible old-growth (USDA Forest Service 2004a Table 3-83). These are stands that meet the minimum age for potential old growth. In addition, the revised Forest Plan allocates approximately 169,000 acres of the Chattahoochee NF to old-growth and old-growth compatible management prescriptions (USDA Forest Service 2004a Table 3-85). This is approximately 23 percent of the Forest acres. There are no activities planned for the Davenport Mountain that would affect the availability or development of old-growth forests. Therefore no cumulative effects to old-growth habitat are expected.

Effects of Alternative 3

Direct Effects – The effects of this alternative would be similar to Alternative 2. No treatments are planned in the stands identified as future old growth. These stands will be managed to protect their old-growth characteristics during the Plan cycle.

Indirect Effects - Through time some of the older stands will reach minimum old growth age and begin to develop old-growth conditions.

Cumulative Effects – The cumulative effects of this alternative are similar to Alternative 2. There are no stands in the Davenport Mountain project area that meet the minimum age for potential old growth and no treatments are planned in the stands identified as future old growth. There are no activities planned for the Davenport Mountain that would affect the availability or development of old-growth forests. Therefore no cumulative effects to old-growth habitat are expected.

Element - Forest Interior Birds

Measure - Effects on habitat conditions and populations of associated species from project activities.

Bounds of Analysis – Spatial: Compartment 407, 408, and 416 and adjacent private lands. **Temporal:** Approximately 10 years following implementation

Existing Conditions

Forest interior birds associated with contiguous blocks of mature forests. They avoid forest edges during nesting and can be sensitive to forest fragmentation. The project area is comprised of several tracts, the largest of which is located in the 1200 acre tract encompassing Davenport Mountain (Compartment 408 and 416). This is the largest tract of National Forest lands adjacent to Nottely Lake. It provides a relatively large block of contiguous forested habitat and therefore provides suitable habitat for forest interior birds. The surrounding private lands are a mixture of forest land, pastures, and residential development.

The revised Forest Plan identified the ovenbird as a MIS to help indicate the effects of management on species associated with interior forest habitats on the Chattahoochee National Forest. Ovenbirds are strongly associated with mature forest interior habitats (Hamel 1992, Crawford et al. 1981). They generally breed in closed canopy deciduous or mixed forests with limited understory. The availability of older hardwood stands on the Forest has increased over the last few decades. The ovenbird is a common breeding bird on the Brasstown Ranger District and has been reported from Breeding Bird Surveys in the Davenport project area. Given the availability of interior forest habitat, population levels likely are moderate.

Effects of Alternative 1 (No Action)

Direct Effects - This alternative will perpetuate current conditions and no direct impacts to interior forest habitat are expected.

Indirect Effects- Through time, the amount of interior forest habitat will increase as the Forest matures. This should result in improved habitat conditions for the ovenbird and other species that utilize interior forest habitats.

Cumulative Effects - Landscape-scale habitat patterns influence the effects of forest fragmentation. Forest-level analysis indicates that the great majority of the Chattahoochee National Forest occurs within a landscape that is more than 70 percent forested (USDA Forest Service 2004a). In these forest-dominated landscapes, edge effects are not expected to significantly influence productivity of interior forest species. While the Davenport Mountain area provides moderate levels of interior forest habitat; these habitats are abundant on the Forest as a whole. The availability of interior forest conditions on the Forest is expected to increase through the implementation of the revised Forest Plan (USDA Forest Service 2004a). Bird survey data suggests that ovenbird populations have been relatively stable on the Forest during the last decade (USDA Forest Service 2005). Populations are expected to increase on the Forest through the implementation of the revised Forest Plan (USDA Forest Service 2004a). Additional residential development may decrease the availability of contiguous forest habitat on private lands. However, there are no additional activities planned for the Davenport

Mountain that would affect the availability of interior forests. Therefore no cumulative effects to interior forest habitat and associated species such as ovenbird are expected.

Effects of Alternative 2 (Proposed Action)

Direct Effects – The treatments proposed under this alternative include thinning, prescribed burning, herbicide application, firebreak and trail construction, and wildlife development. None of these treatments will substantially impact the availability of interior forest habitat. The thinning of both the pine plantations and the oak-shortleaf pine stands will result in an opening of the canopy in these stands. However, most of the openings created by these treatments will be small and a continuous forest canopy will be maintained over the majority of the area. Similarly, prescribed burning, herbicide application, firebreak construction and OHV trail construction will not result appreciable changes to interior forest conditions. Wildlife opening development activities will be restricted to the existing permanent openings and no new permanent openings will be created. The 2 SPB killed stands proposed for reforestation do not provide interior forest habitat in their current condition. Habitat conditions and populations of interior forest species such as the ovenbird will be maintained.

There will be no direct effects of the herbicide application on ovenbirds or other forest interior birds. Hazard quotients (summarized in Appendix B, project folder) for small birds consuming contaminated insects are well below 1.0 for all herbicide applications proposed in this alternative indicating low risk, even at upper levels of exposure.

Indirect Effects- Through time, the amount of mature interior forest habitat will increase as forests in the area mature. This should result in improved habitat conditions for the ovenbird and other species that utilize mature interior forest habitats.

Cumulative Effects - While the Davenport Mountain area provides moderate levels of interior forest habitat; these habitats are abundant on the Forest as a whole. The availability of interior forest conditions on the Forest is expected to increase through the implementation of the revised Forest Plan (USDA Forest Service 2004a). Bird survey data suggests that ovenbird populations have been relatively stable on the Forest during the last decade (USDA Forest Service 2005). Populations are expected to increase on the Forest through the implementation of the revised Forest Plan (USDA Forest Service 2004a). Additional residential development may decrease the availability of contiguous forest habitat on private lands. However, there are no additional activities planned for the Davenport Mountain that would affect the availability of interior forests. Therefore no cumulative effects to interior forest habitat and associated species such as ovenbird are expected.

Effects of Alternative 3:

Direct Effects – The direct of this alternative would be similar to Alternative 2. None of these treatments will substantially impact the availability of interior forest habitat.

Habitat conditions and populations of interior forest species such as the ovenbird will be maintained.

Indirect Effects - The indirect of this alternative would be similar to Alternative 2. Through time, the amount of mature forest habitat will increase as the forests in the area mature. This should result in improved habitat conditions for the ovenbird and other species that utilize interior forest habitats.

Cumulative Effects – The cumulative effects of this alternative will be similar to Alternative 2. Additional residential development may decrease the availability of contiguous forest habitat on private lands. However, there are no additional activities planned for the Davenport Mountain that would affect the availability of interior forests. Therefore no cumulative effects to interior forest habitat and associated species such as ovenbird are expected.

Element - Permanent Openings, Old Fields, Rights-of Way, Improved Pastures

Measure - Effects on habitat conditions and populations of associated species from project activities.

Bounds of Analysis – **Spatial:** Compartment 407, 408, and 416 and adjacent private lands. **Temporal:** Approximately 10 years following implementation

Existing Conditions

There are 2 old farm tracts, the Brown Tract (Compartment 408) and the Davenport Tract (Compartment 407) in the Davenport Mountain project area. These tracts include approximately 25 acres of old fields that currently are managed as permanent openings. Portions of these fields are planted each year to seed-producing crops such as grain sorghum, browntop millet, and sunflowers for quail and other small game under a Challenge-Cost Share Agreement with the Appalachian Pointing Dog Club. The remaining fields are dominated by fescue and annual weed species. These openings are managed by periodic bushhogging and prescribed burning. The fields that are dominated by fescue provide very limited wildlife benefit due to its poor quality and low palatability. Some of the fescue fields have been periodically planted clover following several years of grain sorghum to reduce fescue competition. However, without further treatment (such as herbicides), fescue dominance returns after a few years.

Adjacent private lands are a mixture of forest land, open land, and residential development. The open lands include a Christmas tree farm, unimproved pastures, and residential lawns and provide limited wildlife benefits.

Effects of Alternative 1 (No Action)

Direct Effects- Current management of the existing openings would continue under this alternative and no changes in habitat conditions are expected. Ongoing wildlife opening

maintenance and annual plantings would continue. However, under current management, a large proportion of the fields would continue to be dominated by fescue and annual weeds.

Indirect Effects – This alternative will perpetuate the current conditions of the existing wildlife openings and no change in wildlife populations associated with these openings is expected. While beneficial habitat conditions for a variety of wildlife will be provided, these benefits will continue to be limited by the dominance of low quality fescue in many of the fields.

Cumulative Effects - There currently are approximately 1300 acres of permanent openings on the Chattahoochee National Forest, which represents less than 0.2 percent of the Forest (USDA Forest Service 2004a). The revised Forest plan permits the construction of new permanent openings on nearly 70 percent of the Forest; however manpower and funding limitations likely will restrict the amount of new opening construction. Many of the openings are planted in high-quality grass-clover mixtures, but many of the older openings such as the Brown and Davenport Tracts are dominated by fescue. Where the use of tools such as herbicides are restricted, opportunities to convert these fields to more productive conditions will be limited. Openings on adjacent private lands are not maintained in high quality habitat conditions. Many of the existing open lands on private land likely will be lost to residential development in the future.

Effects of Alternative 2 (Proposed Action)

Direct Effects - The wildlife opening renovation treatments proposed under this alternative will result in improved habitat conditions in these existing fields. The activities proposed, including selective herbicide application would facilitate the control of fescue and poor quality species and allow for the establishment of clover and other desirable cool season species and native warm season grasses. Approximately 20 acres of exiting fields will be renovated, approximately 10 acres to cool season and 10 acres to warm season species. A portion of fields will continue to be planted in annual small grains.

There will be no direct effects to wildlife from the herbicide use (glyphosate) to renovate the wildlife openings. Glyphosate would be applied using a boom sprayer pulled by a farm tractor. Details of the herbicide risk assessment for glyphosate are summarized in Appendix B. All wildlife related hazard quotients (HQ) with typical exposures through direct spray, and consumption of contaminated vegetation, water, and insects all are less than 1.0 for glyphosate, indicating exposure levels not of concern.

Indirect Effects- The establishment of desirable cool season and warm season species will result in improved habitat conditions for a variety of wildlife species associated with open habitats. Permanent openings containing clover and other high quality cool season species are heavily utilized by game species such as deer (Kammermeyer et al. 1993), turkeys (Healey and Nenno 1983), ruffed grouse (Dimmick et al. 1996) and a number of non-game species of birds and mammals (Parker et al. 1992). There also will be wildlife

benefits from the fields established in native warm season grasses. These grasses provide nesting, brood-rearing, and roosting habitat for quail and other grassland species (Dimmick et al 2002). The combination of cool season and warm season plantings will contribute to year-round benefits to wildlife on the Brown and Davenport Tracts.

Cumulative Effects - There currently are approximately 1300 acres of permanent openings on the Chattahoochee National Forest, which represents less than 0.2 percent of the Forest (USDA Forest Service 2004a). Many of the older openings on the Forest such as the Brown and Davenport Tracts are dominated by fescue and other undesirable species. The renovation of unproductive wildlife openings using herbicides such as is proposed in this project are underway on a small portion of these openings. Georgia Department of Natural Resources personnel currently are using herbicides to annually renovate approximately 140 acres of existing openings located on Wildlife Management Areas (WMAs) on the Toccoa, Brasstown, Tallulah, and Chattooga Ranger Districts. Currently, herbicides are not being used to renovate openings on National Forest lands outside of these WMAs. Therefore herbicides are being used on only a fraction of these older fields. Where the use of tools such as herbicides are restricted, opportunities to convert these fields to more productive conditions are limited. Openings on adjacent private lands are not maintained in high quality habitat conditions. Many of the existing open lands on private land likely will be lost to residential development in the future.

Effects of Alternative 3

Direct Effects – Under this alternative, wildlife opening renovation would occur using mechanical methods only without the use of herbicides. In the fields with heavy fescue cover, they would be plowed and established in grain sorghum for 2 successive years to reduce fescue competition prior to the establishment of desirable cool season or warm season grasses. Although establishment of the desired species is expected, the chance of a successful conversion of these fields using mechanical methods only are less than with the use of herbicides. In addition, length of time these mechanically renovated fields will persist before undesirable species reinvade them will be much shorter than with the use of herbicides. More frequent plowing and renovation will be required to maintain desirable cover.

Indirect Effects - As in Alternative 2, the establishment of desirable cool season and warm season species will result in improved habitat conditions for a variety of wildlife species associated with open habitats. However, as discussed above, the dominance and longevity of these desirable plants will be reduced using manual means only. As a result, the benefits to game and non-game species of wildlife will be more limited than in Alternative 2.

Cumulative Effects – The cumulative effects of this alternative will be similar to Alternative 2. However, where the use of tools such as herbicides are restricted, opportunities to convert these fields to more productive conditions will be limited. Openings on adjacent private lands are not maintained in high quality habitat conditions.

Many of the existing open lands on private land likely will be lost to residential development in the future.

SPECIAL HABITAT ATTRIBUTES

Element - Riparian Habitats

Measure - Effects on habitat conditions and populations of associated species from project activities.

Bounds of Analysis – **Spatial:** Riparian habitats within Compartment 407, 408, and 416 and adjacent private lands. **Temporal:** Approximately 10 years following implementation

Existing Conditions

There are several headwater streams in the project area. Most are small streams (1st and 2nd order) that drain directly into Lake Nottely. Due to their small size, they provide limited riparian habitat. Low Creek, the only major perennial stream, flows through both the Davenport and Brown old farm tracts. These tracts were actively farmed prior to Forest Service acquisition. Fields were cleared down to the stream edge and as a result, portions of the forested riparian area along this stream are relatively narrow. The Forest Service has worked to reestablish the riparian vegetation by limiting activities near the stream. While portions of the riparian area contain mature trees, some segments still consists of relatively and young trees and brush.

The revised Forest Plan identified the Acadian Flycatcher as the MIS to represent Mid-Late Successional Riparian Habitat Conditions. Habitat for the Acadian flycatcher consists of deciduous forests near streams (Hamel 1992). Preferred habitat for this species is moist bottomlands, swamps, and riparian thickets. Usually this bird builds its nest in branches directly overhanging streams. The Acadian Flycatcher has not been reported from Breeding Bird Surveys in the project area. However, the limited number of survey points were in upland areas. The Acadian flycatcher is a common breeding bird on the Brasstown Ranger District and likely occurs in the project area. However, given the limited quantity of mature riparian habitat population levels likely are low.

Effects of Alternative 1 (No Action):

Direct Effects - This alternative will perpetuate current conditions and no direct impacts to riparian habitat are expected.

Indirect Effects- Through time, the amount of mid-late successional riparian habitat will increase as the portions containing young forests mature. This should result in improved habitat conditions for the Acadian Flycatcher and other species that utilize mature riparian habitats.

Cumulative Effects- Mid-Late Successional forested riparian habitat is common on the Forest and the availability of these older riparian habitats is expected to increase through time with the implementation of the revised Forest Plan (USDA Forest Service 2004a). Riparian Corridor standards will be followed on all projects on the Forest to maintain desirable habitat conditions in the riparian corridor. Bird survey data suggests that Acadian Flycatcher populations have been relatively stable on the Forest and populations are expected to increase on the Forest through the implementation of the revised Forest Plan (USDA Forest Service 2004a, 2005). There are no activities planned for the Davenport Mountain area that would affect the availability of mature riparian forests. Therefore no cumulative effects to riparian habitat and associated species such as Acadian flycatchers are expected.

Effects of Alternative 2: (Proposed Action):

Direct Effects- The thinning, prescribed burning, herbicide application, firebreak and trail construction, and wildlife development have the potential to impact riparian habitat conditions. However, application of riparian corridor standards (MRx 11) and Best Management Practices (BMPs) will ensure that desired conditions in the riparian corridor will be maintained and enhanced. These include provisions for controlling impacts from activities such as vegetation management, fireline construction, and trail construction. . In addition, several project-specific measures will ensure that riparian conditions are maintained. The canopy removal associated with the oak- pine woodland restoration will be restricted to the upland areas and no thinning will occur in the riparian zones. Prescribed fire in the riparian zone will consist of low intensity, backing fires that will result in little change to the vegetation conditions in these areas. The wildlife opening renovation will be restricted to the portions of the fields outside of the riparian corridor to permit the continued recovery of these areas. No herbicide application will occur within the riparian corridor As a result of these measures, riparian habitat conditions and populations of associated species such as the Acadian Flycatcher will be maintained.

Indirect Effects- Through time, the amount of mid-late successional riparian habitat will increase as the portions containing young forests mature. This should result in improved habitat conditions for the Acadian Flycatcher and other species that utilize mature riparian habitats.

Cumulative Effects- Mid-Late Successional forested riparian habitat is common on the Forest and the availability of these older riparian habitats is expected to increase through time with the implementation of the revised Forest Plan (USDA Forest Service 2004a). Riparian Corridor standards will be followed on all projects on the Forest to maintain desirable habitat conditions in the riparian corridor. Bird survey data suggests that Acadian Flycatcher populations have been relatively stable on the Forest and populations are expected to increase on the Forest through the implementation of the revised Forest Plan (USDA Forest Service 2004a, 2005). There are no activities planned for the Davenport Mountain area that would affect the availability of mature riparian forests. Therefore no cumulative effects to riparian habitat and associated species such as Acadian flycatchers are expected.

Effects of Alternative 3:

Direct Effects – The direct of this alternative would be similar to Alternative 2. The application of riparian corridor standards (MRx 11), Best Management Practices (BMPs), and project-specific measures will ensure that desired conditions in the riparian corridor and populations of associated species such as the Acadian Flycatcher will be maintained.

Indirect Effects: The indirect of this alternative would be similar to Alternative 2. Through time, the amount of mid-late successional riparian habitat will increase as the portions containing young forests mature. This should result in improved habitat conditions for the Acadian Flycatcher and other species that utilize mature riparian habitats.

Cumulative Effects: There are no activities planned for the Davenport Mountain area that would affect the availability of mature riparian forests. Therefore no cumulative effects to riparian habitat and associated species such as Acadian flycatchers are expected.

Element - Snags, Dens, and Downed Wood

Measure - Effects on habitat conditions and populations of associated species from project activities.

Bounds of Analysis – **Spatial:** Habitat Conditions in Compartment 407, 408, and 416 and adjacent private lands. **Temporal:** Approximately 10 years following implementation

Existing Conditions

Snags, dens, and downed wood are important habitat element for a variety of species of wildlife. Large snags are used as nesting and feeding sites and perches by birds, and roosting and maternity habitat for bats. Den trees are used for nesting, roosting and hibernating by a variety of species. Downed woody debris provides cover and feeding sites for amphibians, reptiles, small mammals, and invertebrates. These elements are typically most abundant in older forests. Approximately 41% of the Davenport Mountain area is greater than 60 years-of-age and 21% is in late successional conditions (greater than 80 years-of-age). Additional snags and downed wood have been created as a result of the recent Southern Pine Beetle activity in the area.

The revised Forest Plan identified the pileated woodpecker as a MIS to help indicate the effects of management on species that utilize snags. Habitat consists of mature (60+ years) and extensive hardwood and hardwood-pine forest (Hamel 1992). Preferred habitat is primarily deep woods, swamps, or river bottom forests. The pileated woodpecker can also be found in rather open, upland forest of mixed forest types. This bird forages and nests on and in snags, with some foraging also occurring on fallen logs and other forest debris. This species requires snags for nesting and foraging. The Pileated Woodpecker is a common breeding bird on the Brasstown Ranger District and has been reported from Breeding

Bird Surveys in the Davenport project area. Given the availability of mid-late successional forest habitat, population levels likely are moderate.

Effects of Alternative 1 (No-Action):

Direct Effects- This alternative will perpetuate current conditions and no direct impacts to snags, dens, and downed wood are expected.

Indirect Effects – Through time, the amount of mid-late successional habitat will increase as the forests in the area mature. This should result in improved habitat conditions for the Pileated woodpecker and other species that utilize snags, dens, and downed wood.

Cumulative Effects – Recruitment of snags, dens, and downed wood is most dependent on providing abundant late successional forests. The availability of these habitats is expected to increase through time with the implementation of the revised Forest Plan (USDA Forest Service 2004a). The revised Forest plan has several standards that ensure the retention and recruitment of snags and den trees. Bird survey data suggests that pileated woodpecker populations have been relatively stable on the Forest during the last decade and are expected to increase on the Forest through the implementation of the revised Forest Plan (USDA Forest Service 2004a, 2005). There are no additional activities planned for the Davenport Mountain area that would affect the availability of snags, dens, or downed wood. Therefore no cumulative effects to these habitat elements and associated species such as Pileated woodpeckers are expected.

Effects of Alternative 2 (Proposed Action):

Direct Effects- The thinning, prescribed burning, and firebreak and trail construction have the potential to impact the availability of snags, dens, and downed wood. However, Forest-wide standards will be followed that ensure the retention and recruitment of these habitat elements on the landscape. These standards require that standing snags and den trees will not be cut during vegetation management treatments unrelated to salvage unless necessary for insect and disease control or public safety. Existing snags and den trees will be retained during the thinning of the white pine and Virginia pine plantations, and thinning associated with the oak/shortleaf pine woodland restoration. Similarly, impacts to existing snags and den trees will be avoided during the OHV trail construction unless retaining of a snag would pose a safety hazard to the trail. The majority of the firebreak construction will occur in young pine plantations with a low abundance of snags and den trees. Therefore, although snags immediately adjacent to the private property line may be removed, the firebreak construction is unlikely to appreciably affect the availability of snags.

Under this alternative, two Southern Pine Beetle damaged stands (18 acres) will be reforested. These stands currently contain a large number of small diameter (4-6" DBH) pine snags. Many of these snags will be chainsaw felled to prepare the site for planting. However, following the direction provided in the revised Forest Plan, all live den trees

and a minimum of 5 snags per acre from the largest size classes will be retained during this treatment. Therefore, although these reforestation treatments will reduce the number of snags in these beetle-killed stands, a sufficient supply of snags will be retained after treatment.

The prescribed fire treatments proposed in this alternative also may impact existing snags and downed wood. However, prescribed fire also is likely to result in tree mortality, creating new snags and downed wood. In addition, only a portion of the project area will be prescribed burned.

There will be no direct effects of the herbicide application on pileated woodpeckers or other snag-dependent species. Hazard quotients (summarized in Appendix B, project folder) for small birds consuming contaminated insects are well below 1.0 for all herbicide applications proposed in this alternative indicating low risk, even at upper levels of exposure.

Although some reduction in the availability of snags and downed wood may occur as a result of the implementation of this alternative, these habitat elements still will be common in the project area. Habitat conditions and populations of snag-dependent species such as the Pileated Woodpecker will be maintained.

Indirect Effects - Through time, the amount of mid-late successional habitat will increase as the forests in the area mature. This should result in improved habitat conditions for the Pileated woodpecker and other species that utilize snags, dens, and downed wood.

Cumulative Effects – Recruitment of snags, dens, and downed wood is most dependent on providing abundant late successional forests. The availability of these habitats is expected to increase through time with the implementation of the revised Forest Plan (USDA Forest Service 2004a). The revised Forest plan has several standards that ensure the retention and recruitment of snags and den trees. Bird survey data suggests that pileated woodpecker populations have been relatively stable on the Forest during the last decade and are expected to increase on the Forest through the implementation of the revised Forest Plan (USDA Forest Service 2004a, 2005). There are no additional activities planned for the Davenport Mountain area that would affect the availability of snags, dens, or downed wood. Therefore no cumulative effects to these habitat elements and associated species such as Pileated woodpeckers are expected.

Effects of Alternative 3:

Direct Effects – The direct of this alternative would be similar to Alternative 2. Although some reduction in the availability of snags and downed wood may occur as a result of the implementation of this alternative, these habitat elements still will be common in the project area. Habitat conditions and populations of snag-dependent species such as the Pileated Woodpecker will be maintained.

Indirect Effects - The indirect of this alternative would be similar to Alternative 2. Through time, the amount of mid-late successional habitat will increase as the forests in the area mature. This should result in improved habitat conditions for the Pileated woodpecker and other species that utilize snags, dens, and downed wood.

Cumulative Effects- There are no additional activities planned for the Davenport Mountain area that would affect the availability of snags, dens, or downed wood. Therefore no cumulative effects to these habitat elements and associated species such as Pileated woodpeckers are expected.

Element - Aquatic Habitats

Measure - Effects on habitat conditions and populations of associated species from project activities.

Bounds of Analysis – Spatial: Habitat Conditions in Compartment 407, 408, and 416 and adjacent private lands. **Temporal:** Approximately 10 years following implementation

Existing Conditions

Low Creek is the only major perennial stream in the project area. It is typical of most low elevation streams that feed the mountain reservoirs such as Lake Nottely. Fish species present include sculpin, bluegill, yellow perch, creek chubs, and native lamprey. The stream approximately 5 feet wide and relatively shallow with limited pool habitat. As discussed above, portions of the forested riparian area along this stream are relatively narrow. While portions of the riparian area contain mature trees, some segments still consists of relatively and young trees and brush.

There also are several smaller headwater streams (1st and 2nd order) that drain directly into Lake Nottely. Due to their small size, most are fishless.

Lake Nottely is a 4181 acre reservoir managed by TVA. It contains a variety of game fish including striped bass, hybrid bass, white bass, largemouth bass, spotted bass, small mouth bass, crappie, and catfish. As with many drawdown reservoirs, cover is limited in much of the lake.

Effects of Alternative 1 (No Action):

Direct Effects - This alternative will perpetuate current conditions and no direct impacts to aquatic habitat are expected.

Indirect Effects- Through time, the areas of young forest along Low Creek will mature. This should result in increased streamside shading, woody debris input into the stream, and improved conditions for aquatic species.

Cumulative Effects – The Chattahoochee National Forest has 2,436 miles of perennial streams, including 1,770 miles of cold water streams and 666 miles of cool water streams (USDA Forest Service 2004a). There are approximately 19, 449 acres of impoundments within the proclamation boundary of the Forest, a number of which like Lake Nottely are managed by TVA or Georgia Power. Riparian Corridor standards, forestwide standards and Best Management practices (BMPs) will be followed on all projects on the Forest to protect water quality and aquatic habitat condition. There are no activities planned for the Davenport Mountain area that would affect the aquatic habitat conditions and therefore no cumulative effects are expected.

Effects of Alternative 2: (Proposed Action):

Direct Effects- The thinning, prescribed burning, herbicide application, firebreak and trail construction, and wildlife development have the potential to impact aquatic habitat conditions. However, application of riparian corridor standards (MRx 11) and Best Management Practices (BMPs) will ensure that water quality and aquatic habitat conditions will be maintained and enhanced. These include provisions for controlling impacts from activities such as vegetation management, fireline construction, trail construction, and herbicide use.

Ground disturbance will occur in the development of temporary roads, skid trails, and log landings during the commercial thinning operations. However, water quality and aquatic habitat will be protected in the project area by the delineation of riparian corridors and the implementation of the standards in the Forest Plan. Major ground disturbing activities such as roads and trails (except at designated crossings) and log landings are prohibited from the riparian corridor and all silvicultural activities within this corridor will be conducted to meet or exceed compliance with BMPs.

Existing roads and streams will be used for the majority of the prescribed burn control lines. To minimize soil disturbance from fireline construction, use of heavy mechanized equipment (e.g. bulldozers) in wetlands or riparian corridors is prohibited. Hand lines will be used to create firelines near streams.

Approximately 1/4 mile of new OHV trail will be constructed under this alternative. However, all new trail construction will occur outside of the riparian corridor and no new stream crossings will be required. Therefore, there will be no impact to aquatic habitats from OHV trail construction.

Under this alternative herbicide use is proposed to release planted oak and shortleaf pine seedlings, selective control invasive species, and renovate existing permanent wildlife openings. Details of the herbicide risk assessment are summarized in Appendix B. Acute exposure hazard quotients to fish and aquatic invertebrates for accidental spills have calculated values over 1.0 for glyphosate and triclopyr ester (fish only). However, glyphosate is strongly adsorbed to (bound to the surface of) both organic matter and clay particles. Therefore it is very immobile in the environment, and unlikely to reach aquatic habitat. Even in the unlikely event that it might reach the stream it would probably be

quickly bound to sediment or organic matter in the stream. In addition, with the provision of riparian buffer strips on stream zones, the risk is further reduced. This includes a standard that prohibits herbicide application within 100 horizontal feet of lakes, wetlands, or perennial or intermittent springs and seeps (FW standard FW-022). Mixing and dilution in flowing streams will minimize any potential hazard from any small spills which might occur during implementation of this project. The effects of herbicide application on water quality and aquatic habitat also are addressed in the Water section of this EA.

The construction of fish attractors/cover in Lake Nottely will enhance habitat conditions for the lake fish community. Cover is very limited in these winter drawdown reservoirs and the placement of trees and brush in selective coves will provide escape cover and feeding for young fish as well as adults. These structures also are effective in concentrating fish and increasing angling success.

Indirect Effects – The application of riparian corridor standards (MRx 11) and Best Management Practices (BMPs) will ensure that there will be no impacts to water quality and aquatic habitat conditions downstream of project activities. Through time, the areas of young forest along Low Creek will mature. This should result in increased streamside shading, woody debris input into the stream, and improved conditions for aquatic species.

Cumulative Effects – Riparian Corridor standards, forestwide standards and Best Management practices (BMPs) will be followed on all projects on the Forest to protect water quality and aquatic habitat condition. There are no activities planned for the Davenport Mountain area that would affect the aquatic habitat conditions and therefore no cumulative effects are expected.

Effects of Alternative 3

Direct Effects – The direct of this alternative would be similar to Alternative 2. However, there would be no new OHV trail construction in this alternative, which will reduce the amount of ground disturbance as compared to Alternative 2. In addition, no herbicides will be used under this alternative. In the case of the wildlife opening renovation, this will require more extensive and frequent plowing of the existing openings to control undesirable species such as fescue. Although this has the potential to impact aquatic habitats due to greater ground disturbance, the wildlife opening renovation will be restricted to the portions of the fields outside of the riparian corridor. Therefore, no impacts to aquatic habitat are expected.

The application of riparian corridor standards (MRx 11) and Best Management Practices (BMPs) for all project actions will ensure that water quality and aquatic habitat conditions will be maintained and enhanced.

Indirect Effects - The indirect of this alternative would be similar to Alternative 2. The application of riparian corridor standards (MRx 11) and Best Management Practices (BMPs) will ensure that there will be no impacts to water quality and aquatic habitat

conditions downstream of project activities. Through time, the areas of young forest along Low Creek will mature. This should result in increased streamside shading, woody debris input into the stream, and improved conditions for aquatic species.

Cumulative Effects- Riparian Corridor standards, forestwide standards and Best Management practices (BMPs) will be followed on all projects on the Forest to protect water quality and aquatic habitat condition. There are no activities planned for the Davenport Mountain area that would affect the aquatic habitat conditions and therefore no cumulative effects are expected.

Element - Threatened, Endangered, Sensitive Species and Locally Rare Species

Measure - Effects on habitat conditions and populations of PETS and Locally Rare species from project activities.

Bounds of Analysis – Spatial: Habitat Conditions in Compartment 407, 408, and 416 and adjacent private lands. **Temporal:** Approximately 10 years following implementation

Threatened and Endangered Species

Existing Conditions

Effects to federally-listed threatened and endangered species are analyzed in detail in the Biological Evaluation for this project. Results are summarized here. Based on this analysis, the only federally-listed species that occurs in the vicinity of the project is the Federally Threatened Bald Eagle (*Haliaeetus leucocephalus*).

Bald eagles have been observed foraging on Lake Nottely, Chatuge, and Blue Ridge on or near the Chattahoochee NF and Lake Oconee, Lake Sinclair, the Oconee River, and Ocmulgee River on or near the Oconee NF. (USDA Forest Service 2004d: Biological Assessment). Currently no bald eagle nests are known to occur on the Forest. However, eagle nests are present near the Oconee NF on Lake Sinclair, Lake Jackson, and Lake Juliette. Eagle nesting also has been reported from Carters Lake near Oakman, south of the Chattahoochee NF.

Bald eagles are occasionally observed foraging on Lake Nottely throughout the year. There currently are no known bald eagle nests on the lake based on aerial nesting surveys by Georgia DNR personnel (J.Ozier, GADNR, pers.comm.). There is a historic record for a possible bald eagle nest on the southeastern portion of Lake Nottely. However this nest was never confirmed and has since been blown down.

Effects of Alternative 1 (No Action):

Direct Effects - This alternative will perpetuate current conditions and no direct impacts to bald eagles are expected.

Indirect Effects - The continued maturation of the Forest will maintain and enhance suitable conditions for future nesting opportunities for bald eagles in the Lake Nottely vicinity.

Cumulative Effects - Much of the private lands surrounding Lake Nottely is heavily developed and additional development is occurring at a rapid pace. This will limit future nesting opportunities on private lands. However, the continued maturation of National Forest will maintain and enhance suitable conditions for future bald eagle nesting opportunities.

There currently are no known bald eagle nests on or near Lake Nottely. Georgia DNR will continue to conduct mid-winter aerial surveys for bald eagles. The revised Forest Plan includes standards to provide protection zone around nests and roost sites if a nest is found in the future. In addition, the Riparian Corridor Management Prescription (MRx 11) with its emphasis on low levels of disturbance and maintenance of mature forests provides direction for management of shorelines where bald eagles may forage. There are no activities planned for the Davenport Mountain area that would affect habitat conditions for bald eagles and therefore no cumulative effects are expected

Effects of Alternative 2 (Proposed Action):

Direct Effects – There are no bald eagle nests or known roost sites on the Davenport project area. Therefore activities such as thinning, prescribed burning, firebreak and trail construction, and wildlife habitat development will have no direct effects on bald eagles.

Details of the herbicide risk assessment are summarized in Appendix B. Hazard quotients for typical exposures are projected to be greater than 1.0 for large birds only for triclopyr (amine) cut surface application. With cut surface or injection application, the amount of non-target vegetation subject to spray deposition is very small. Bald eagles forage for fish and do not consume vegetation. Therefore they would be unlikely to come in contact with the treated vegetation. Treatment buffers along streams and lakes will reduce the risk of herbicides entering Lake Nottely. Hazard quotients for fish-eating birds such as eagles are well below 1.0 for all herbicide applications proposed in this alternative indicating low risk, even at upper levels of exposure. Therefore the activities proposed in this alternative are not likely to adversely affect the bald eagle.

Indirect Effects- The remnant mature shortleaf pines will be retained during the thinning prescribed for the woodland restoration. This will increase vigor in the remaining trees and increase their resistance to southern pine beetle attacks. These mature pines will provide potential bald eagle nesting and roost habitat in the future.

Cumulative Effects - Much of the private lands surrounding Lake Nottely is heavily developed and additional development is occurring at a rapid pace. This will limit future nesting opportunities on private lands. However, the continued maturation of National

Forest will maintain and enhance suitable conditions for future bald eagle nesting opportunities.

There currently are no known bald eagle nests on or near Lake Nottely. Georgia DNR will continue to conduct mid-winter aerial surveys for bald eagles. The revised Forest Plan includes standards to provide protection zone around nests and roost sites if a nest is found in the future. In addition, the Riparian Corridor Management Prescription (MRx 11) with its emphasis on low levels of disturbance and maintenance of mature forests provides direction for management of shorelines where bald eagles may forage. There are no additional activities planned for the Davenport Mountain area that would affect habitat conditions for bald eagles and therefore no cumulative effects are expected

Effects of Alternative 3:

Direct Effects – The effects of this alternative would be similar to Alternative 2. There will be no direct effects of this alternative on the bald eagle.

Indirect Effects- The indirect effects of this alternative would be similar to Alternative 2. The mature pines retained following the proposed activities will provide potential bald eagle nesting and roost habitat in the future.

Cumulative Effects – The cumulative effects of this alternative are similar to Alternative 2. There currently are no known bald eagle nests on or near Lake Nottely. There are no additional activities planned for the Davenport Mountain area that would affect habitat conditions for bald eagles and therefore no cumulative effects are expected

Viability Concern Species

Existing Conditions - Effects to Regional Forester Sensitive Species are analyzed in detail in the Biological Evaluation for this project. These species are those for which there is concern for viability of their populations across their range. Based on this analysis, 7 Sensitive Species occur or potentially occur in the vicinity of the project. In addition, 6 other species of local viability concern are also addressed here because they occur or potentially occur in the vicinity of the project. This was determined by: (1) consulting 14 years of Forest Service plant inventory records, (2) consulting Georgia Natural Heritage Program (GNHP) records, (3) consulting University of Georgia (UGA), Forest Service, and Georgia Department of Natural Resources (GADNR) aquatic inventory records, (4) reviewing U.S. Fish and Wildlife Service county lists for potential species in Union County, (5) ongoing discussions with GNHP, Forest Service, and other agency biologists, (6) various scientific references such as technical manuals, herbarium records, NatureServe information, and others, and (7) results from project-level surveys.

Table 19 Viability Concern Species known to occur or with potential to occur in the Davenport Mountain project vicinity.

Scientific Name	Common Name	Status
<i>Corynorhinus rafinesquii</i>	Rafineque's Big-eared Bat	S
<i>Speyeria diana</i>	Diana Fritillary Butterfly	S
<i>Ichthyomyzon greeleyi</i>	Mountain Brook Lamprey	S
<i>Macromia margarita</i>	Margarita River Skimmer	S
<i>Ophiogomphus incurvatus</i>	Appalachian Snaketail	S
<i>Ophiogomphus edundo</i>	Edmunds Snaketail	S
<i>Beloneuria georgiana</i>	Georgia Beloneurian Stonefly	S
<i>Carex scabrata</i>	Rough Sedge	LR
<i>Castilleja coccinea</i>	Indian Paintbrush	LR
<i>Lygodium palmatum</i>	Climbing Fern	LR
<i>Mustela nivalis</i>	Least Weasel	LR
<i>Condylura cristata</i>	Star-nosed Mole	LR
<i>Pituophis m. melanoleucus</i>	Northern Pine Snake	LR

Effects of Alternative 1 (No Action):

Direct Effects - This alternative will perpetuate current conditions and no direct impacts to viability concern species are expected.

Indirect Effects - This alternative will perpetuate current conditions and no indirect impacts to viability concern species are expected.

Cumulative Effects - There are no additional actions planned in the vicinity of the Davenport Mountain road that would adversely affect viability concern species. Surveys have been and continue to be conducted in portions of the Forest to determine presence and distribution of various small mammals, birds, amphibians and reptiles, aquatic species, and PETS and Locally Rare plants. The Georgia National Heritage Program (GNHP) records are checked for known occurrences of PETS and Locally Rare species in project areas, and close contact is maintained between the GNHP biologists and Forest Service biologists for sharing of new information. Forest Service records and other agencies' biologists and records (in addition to GNHP) are consulted for occurrences.

Future management activities and project locations will be analyzed utilizing any new information available on viability concern species. For Sensitive and Locally Rare species, mitigating measures will be implemented where needed to maintain habitat for these species on the Forest and to prevent future listing under the Endangered Species Act.

Effects of Alternative 2 (Proposed Action):

Direct Effects

Rafinesque's Big-eared Bat - There are historic records for the Rafinesque's big-eared bat in Union County (Laerm 1981, GNHP records) however, no big-eared bats were found during recent (2001-2002) mist netting on the Brasstown or Toccoa Ranger Districts. There are no known records of the Rafinesque's big-eared bat near the Davenport Mountain project area.

The Rafinesque's big-eared bat hibernates primarily in caves and old buildings, usually near permanent water (Webster et al. 1985). Harvey (1992) states that maternity colonies are primarily found in old buildings, and are rarely found in caves and mines. There are no caves, mines, or old buildings present in the project area and therefore it does not provide hibernation or maternity habitat.

In the summer, male big-eared bats may roost in hollow trees (Harvey, 1992). Hollow trees are common throughout the Forest and are associated with older forests, typically greater than 60 years of age. There are approximately 680,000 acres of these older Forests on the Chattahoochee-Oconee National Forest. The revised Forest plan contains a standard that provides for protection of existing snags and den trees during vegetation management treatments. As a result, hollow trees will not be cut or intentionally disturbed. Even if a hollow tree is inadvertently damaged, roosting bats are quick to fly away when disturbed on the roost (Ozier 1999), and will promptly relocate (M. Bunch SCDNR, pers. comm. with A. Gaston).

Although the proposed prescribed burning could damage some hollow trees, given their abundance on the Forest, the availability of summer roost trees will not be affected. Since no hibernation habitat is present, big-eared bats are not likely to be present on these sites during the dormant season when the controlled burn will occur.

Details of the herbicide risk assessment are summarized in Appendix B. Bats could be exposed to herbicides via dermal, ingestion, or inhalation routes. The hazard quotient (HQ) for small mammals with typical exposures through direct spray, and consumption of contaminated vegetation, water, and insects all are less than 1.0 for glyphosate, triclopyr amine, triclopyr ester, and imazapyr, indicating exposure levels not of concern.

According to the VMEIS Volume II (USFS 1989), the herbicides analyzed, including the 4 considered here, were rapidly eliminated from the systems of animals studied. In addition, the animals showed low tissue retention of the herbicides. For these reasons, glyphosate, imazapyr, and triclopyr present a very low risk of bioaccumulation.

Diana Fritillary - The Diana fritillary occurs throughout the Southern Appalachians, inhabiting pine and deciduous forests near streams. Violets serve as the host plant for larvae (Scott 1986). Opler (1992) states that males may use a variety of habitats, but primary habitat consists of openings and fields in wet, rich woods. Roads and other

openings in moist woods provide nectar plants for this butterfly (Broadwell 1993). Many of the nectar plants are associated with early successional habitats or forest edges. There are historic reports of this species in White, Union, Fannin, Habersham, and Rabun Counties (Harris 1972). It has recently been observed in a variety of habitats throughout the Forest (C. Wentworth, pers. comm.). Breeding habitats are primarily mesic, cove forests and sometimes bottomland areas (NatureServe 2005). Because it uses a variety of forest types including both pine and hardwood forests of varying successional stages, nearly the entire Forest (750,000 acres), including the stands in the project area provide suitable habitat.

There would be no direct effect of the proposed thinning on the Diana Fritillary. The proposed thinning could impact larval host plants (violets) and nectar plants on the site. However many of the nectar plants likely would increase in this stand due to increased sunlight and would offset any impacts to existing plants. If Diana's were present in the area, they would be present only in the larval (caterpillar) stage at the time of year the prescribed burn would occur. At the end of summer, Diana fritillary eggs are laid next to dried-up violets where they hatch in the fall. The young caterpillars overwinter in the duff without feeding until spring, when they begin feeding on the adjacent violets (Opler 1992). Diana larvae overwinter deep in the duff, and are unlikely to be impacted by dormant season prescribed burns (Adams, pers. comm. with C. Wentworth). The fuel conditions would result in a mosaic pattern of burned area (i.e. portions of the area would not be burned). Therefore, this dormant season burn, which remove only the upper litter layers, should not impact this species. In addition, existing skid trails and roads will be used for much of the control lines so new ground disturbance will be minimal.

According to the VMEIS (vol. II, page 6-9 and 6-15), glyphosate, imazapyr and triclopyr are all relatively nontoxic to insects. Hazard quotients for direct spray of insects (honey bee) are well below 1.0 for all herbicide applications proposed in this alternative indicating low risk, even at upper levels of exposure. During herbicide activities, the Diana fritillary butterfly would likely relocate and would not be present on a cut stump, stems or leaves being directly sprayed by herbicide.

Aquatic Species - The only known Sensitive aquatic species from the Davenport Mountain Project area is the Mountain Brook Lamprey, which is known from the Nottely River, Low Creek, Coosa Creek, and likely occurs in other Nottely River tributaries. Other Sensitive species with the potential to occur include Margarita River Skimmer (*Macromia margarita*), Appalachian Snaketail (*Ophiogomphus incurvatus*), Edmunds Snaketail (*Ophiogomphus edmundo*), and Georgia Beloneurian Stonefly (*Beloneuria georgiana*).

The thinning, prescribed burning, herbicide application, firebreak and trail construction, and wildlife development have the potential to impact aquatic habitat conditions. However, application of riparian corridor standards (MRx 11) and Best Management Practices (BMPs) will ensure that water quality and aquatic habitat conditions will be maintained and enhanced. These include provisions for controlling impacts from activities such as vegetation management, fireline construction, trail construction, and

herbicide use. As a result direct impacts to water quality and aquatic species will be minimal.

Details of the herbicide risk assessment are summarized in Appendix B. Acute exposure hazard quotients to fish and aquatic invertebrates for accidental spills have calculated values over 1.0 for glyphosate and triclopyr ester (fish only). However, glyphosate is strongly adsorbed to (bound to the surface of) both organic matter and clay particles. Therefore it very immobile in the environment, and unlikely to reach aquatic habitat. Even in the unlikely event that it might reach the stream it would probably be quickly bound to sediment or organic matter in the stream. Triclopyr has limited soil mobility. With the provision of riparian buffer strips on stream zones, the risk is further reduced. This includes a standard that prohibits herbicide application within 100 horizontal feet of lakes, wetlands, or perennial or intermittent springs and seeps (FW standard FW-022). Mixing and dilution in flowing streams will minimize any potential hazard from any small spills which might occur during implementation of this project.

Locally Rare Plants - Populations of three locally rare plants, Indian paintbrush, rough sedge and climbing fern were found during botanical inventories of the Davenport Project Area. These populations will be protected by prohibiting logging, logging equipment, tree felling, and herbicide application within the colony site and surrounding buffer area sufficiently large to maintain existing light conditions. Prescribed burning will occur during the dormant season and will not negatively impact these plants. In addition, because the population of rough sedge is located within the channel of a small stream, it also will be protected through the application of riparian corridor standards. The herbicide application proposed in this alternative could impact these locally rare plants. However, direct to these plants are not likely due to the fact herbicide will be applied to specific targeted plants either by application to the cut stump or direct foliar application. Forest Plan Standard FW- 019 prohibits the application of herbicide within 60 feet of any federally listed or sensitive species except to protect them from invasive plant competition. In addition, a project level mitigation measure has been included that provides this same 60 foot buffer distance for locally rare plants. Other Forest Plan standards also prevent impacts to non-target vegetation, such as weather restrictions to prevent drift of herbicide found in standard FW-13, and nozzle size restrictions found in FW-14. In addition, Imazapyr, the only herbicide proposed that has some degree of soil activity (only in the spring); will only be applied from late June to mid September when the chemical has little or no evidence of soil mobility. This will further protect non-targeted vegetation, including rare plants, from any direct impacts.

Least Weasel - The least weasel has been reported from a variety of habitats and elevations most often from early successional habitats including pastures, fencerows, farmland shelterbelts, old-fields, and in and around human buildings (Laerm and Wentworth unpubl.). It is often reported in association with water, including moist meadows, marshes, and forested wetlands. The single Georgia record is from the east side of Nottely Lake, approximately 5 miles from the Davenport Mountain area. The least weasel could be present in the Davenport Mountain project area, particularly in and around the old farm sites. None of the renovation activities will adversely affect potential

habitat for this species. The existing field and stream borders will not be disturbed and in some cases will be allowed to expand. The proposed thinning and burning of the white pine plantations and oak stands may enhance habitat conditions for the least weasel by creating more open stands with a grass/shrub understory.

Details of the herbicide risk assessment are summarized in Appendix B. If present, weasels could be exposed to herbicides via dermal, ingestion, or inhalation routes. The hazard quotient (HQ) for small mammals with typical exposures through direct spray, and consumption of contaminated vegetation, water, and insects all are less than 1.0 for glyphosate, triclopyr amine, triclopyr ester, and imazapyr, indicating exposure levels not of concern. Least weasels primarily feed on small rodents. Hazard quotients for carnivorous mammals consuming contaminated small mammals also are well below 1.0 for all herbicide applications proposed in this alternative indicating low risk, even at upper levels of exposure.

Star-nosed Mole - The star-nosed mole is associated with moist swampy habitats such as marches, bogs, seeps, and streams in both forested and early successional communities (Webster et al. 1985, Laerm 1995). Burrows usually are near water and may open in to them. Nests are constructed in burrows above water level. There are no records of this species in the vicinity of Davenport Mountain. The project area does not contain any marsh or bog habitat, but this species could be found in association with the small streams in the area. These sites will be protected through the application of riparian corridor standards (MRx 11) and Best Management Practices (BMPs). As a result there will be no impacts to potential habitat for the star-nosed mole.

If present, star-nosed moles could be exposed to herbicides via dermal, ingestion, or inhalation routes. The hazard quotient (HQ) for small mammals with typical exposures through direct spray, and consumption of contaminated vegetation, water, and insects all are less than 1.0 for all herbicide applications proposed in this alternative indicating exposure levels not of concern. In addition, with the provision of riparian buffer strips on stream zones, the risk of herbicide contamination in streams is greatly reduced

Northern Pine Snake - The northern pine snake is known from Banks, Burke, Dawson, Lumpkin, Paulding, Pickens, and White Counties (Hermann and Fahey, pers. comm.). Additional counties with records of the snake's occurrence are Cherokee, Cobb, Gilmer, Gwinnett and Rabun (Williamson and Moulis 1994). The northern pine snake is found in dry, upland forests such as those found on the Davenport Mountain project area. This secretive species requires dry, often sandy soil for construction of their burrows, where they spend much of their time underground (Mount, 1975; Martof et al.; 1980, Wilson, 1995). Eggs are laid in nests located in cavities or burrows that are several inches below ground (Mount, 1975). Therefore, the proposed thinning and dormant season prescribed burning activities would have no direct impacts on this snake, which, if present, would likely retreat to its burrow.

Below-ground contamination and dermal absorption of herbicide by the pine snake would be unlikely due to the fact that glyphosate is not mobile in the soil and triclopyr has

limited soil mobility. Imazapyr, which has some soil mobility in the spring, will be applied from late June through mid September when there is little to no evidence of soil mobility. The pine snake's diet consists primarily of small mammals (Martof et al. 1980). Reptiles were not evaluated in the herbicide risk assessment but hazard quotients for carnivorous mammals consuming contaminated small mammals also are well below 1.0 for all herbicide applications proposed in this alternative indicating low risk, even at upper levels of exposure.

Indirect Effects

Rafinesque's Big-eared Bat - Through time, repeated prescribed burning could damage some hollow trees that are used as summer roost for Rafinesque's big-eared bat. However, repeated prescribed burns will result in fire scarring of the residual trees that will lead to the development of additional hollow trees, offsetting any losses of existing potential roosts.

Diana Fritillary - The proposed thinning could impact larval host plants (violets) and nectar plants of the Diana Fritillary. However many of the nectar plants likely would increase in these stands due to increased sunlight and would offset any impacts to existing plants. Nectar plants are not a limiting factor for the Diana, and flowering plants that would provide nectar for the butterfly are commonly found in all types of habitat throughout the Chattahoochee Forest, as well as on private land. Prescribed burning during the dormant season would not harm any nectar plants since the above ground portions would not be present, and the dormant season burn would not damage the root systems. Violets serve as the host plant for Diana fritillary larvae. Violets are common throughout the Forest and could be present within the burn units. However, violets would not be impacted by the dormant season prescribed burn. Herbicide application also could impact nectar plants and violets necessary for the life cycle of Diana fritillary. However, as discussed above, mitigation measure will be implemented to minimize impacts to non-target plants.

Aquatic Species - The application of riparian corridor standards (MRx 11) and Best Management Practices (BMPs) will ensure that there will be no impacts to water quality and aquatic habitat conditions downstream of project activities. Through time, the areas of young forest along Low Creek will mature. This should result in increased streamside shading, woody debris input into the stream, and improved conditions for aquatic species.

Locally Rare Plants - The existing populations of rough sedge and climbing fern will be protected from disturbance. Through time, the amount of mature forest habitat will increase as the portions containing young forests mature. This should provide additional suitable habitat for these species. The development of open woodland conditions through thinning, burning and herbicide release is expected to enhance habitat conditions for Indian paintbrush.

Least Weasel - The least weasel is a specialist predator of small mammals especially voles, lemmings, and other mice (Nature Serve 2005). The thinning, prescribed burning,

and herbicide application proposed in this alternative would likely enhance habitat conditions for the small mammals serving as prey for the least weasel.

Star-nosed Mole - The star-nosed mole could be found in association with the small streams in the Davenport Mountain area. Through time, the areas of young forest along Low Creek will mature. This should result in increased streamside shading, and improved conditions for this species.

Northern Pine Snake - The pine snake's diet consists primarily of small mammals (Martof et al., 1980). The treatments proposed (thinning, burning, herbicide application) will result in the opening of the canopy and increase in herbaceous vegetation. This would likely increase habitat for the small rodents serving as prey for the pine snake.

Cumulative Effects -- There are no additional actions planned in the vicinity of the Davenport Mountain road that would adversely affect viability concern species. The only recent vegetation management activities on Forest Service lands in this area has been prescribed burning and routine maintenance of wildlife openings. There has been no herbicide use in the project vicinity in the last 10 years.

Surveys have been and continue to be conducted in portions of the Forest to determine presence and distribution of various small mammals, birds, amphibians and reptiles, aquatic species, and PETS and Locally Rare plants. The Georgia National Heritage Program (GNHP) records are checked for known occurrences of PETS and Locally Rare species in project areas, and close contact is maintained between the GNHP biologists and Forest Service biologists for sharing of new information. Forest Service records and other agencies' biologists and records (in addition to GNHP) are consulted for occurrences.

Future management activities and project locations will be analyzed utilizing any new information available on viability concern species. For Sensitive and Locally Rare species, mitigating measures will be implemented where needed to maintain habitat for these species on the Forest and to prevent future listing under the Endangered Species Act.

Effects of Alternative 3:

Direct Effects – The direct effects of Alternative 3 on viability concern species would be similar to Alternative 2

Indirect Effects – The indirect effects of Alternative 3 on viability concern species would be similar to Alternative 2.

Cumulative Effects – The cumulative effects of this alternative will be similar to Alternative 2. There are no additional actions planned in the vicinity of the Davenport Mountain road that would adversely affect viability concern species. Surveys have been and continue to be conducted in portions of the Forest to determine presence and distribution of various small mammals, birds, amphibians and reptiles, aquatic species, and PETS and

Locally Rare plants. The Georgia National Heritage Program (GNHP) records are checked for known occurrences of PETS and Locally Rare species in project areas, and close contact is maintained between the GNHP biologists and Forest Service biologists for sharing of new information. Forest Service records and other agencies' biologists and records (in addition to GNHP) are consulted for occurrences.

Future management activities and project locations will be analyzed utilizing any new information available on viability concern species. For Sensitive and Locally Rare species, mitigating measures will be implemented where needed to maintain habitat for these species on the Forest and to prevent future listing under the Endangered Species Act.

DEMAND SPECIES

White-tailed deer was selected as Forest Plan MIS to represent public demand issues and is relevant to this project. Black bears, which are the other Forest Plan Demand Species MIS, do not occur within the project area.

Element - White-tailed Deer

Measure - Effects on habitat conditions and deer populations from project activities. **Bounds of Analysis** – **Spatial:** Habitat Conditions in Compartment 407, 408, and 416 and adjacent private lands. **Temporal:** Approximately 10 years following implementation

Existing Conditions

White-tailed deer was selected as a MIS to help indicate the effects of management in meeting public demand as a hunted species. Deer require a mixture of forest/successional stage habitats to meet their year-round habitat needs. Key requirements include the interspersions of mature mast producing stands during fall and winter, early successional forest to provide browse and soft mast, and high quality permanent openings. Current deer populations are moderate on the Davenport Mountain Project area due to limited availability of early successional habitat and high quality permanent openings.

Effects of Alternative 1 (No Action)

Direct Effects- This alternative will perpetuate current conditions and no direct impacts to white-tailed deer are expected. Current management of the existing openings would continue and no changes in deer habitat conditions are expected. Ongoing wildlife opening maintenance and annual plantings would continue. However, under current management, a large proportion of the fields would continue to be dominated by fescue and annual weeds that provide poor quality forages for deer.

Indirect Effects – Through time, the limited amount of available early successional habitat in the Davenport project area will decline as the forests in the area mature. This should result in a reduction of the availability of deer forages and habitat conditions for deer.

Cumulative Effects - Early successional habitat and high quality permanent openings important for deer are limited on the Davenport Mountain area. These habitats are somewhat more common on the Forest as a whole. Deer harvest data collected by Georgia DNR personnel indicates that deer populations in the mountains and ridge and valley are stable to increasing with some fluctuations primarily due to differences in the annual mast crops (USDA Forest Service 2005). Implementation of the revised Forest Plan is expected to provide a diversity of habitats that will benefit white-tailed deer populations on the Forest (USDA Forest Service 2004a). Continued residential development may reduce the quantity and quality of deer habitat on adjacent private lands. However, no additional activities affecting deer habitat are planned for the Davenport Mountain area. Therefore no cumulative effects to white-tailed deer or their habitat are expected.

Effects of Alternative 2 (Proposed Action)

Direct Effects – A number of the treatments proposed under this alternative will result in improved habitat conditions for deer. The canopy openings resulting from the proposed thinning and reforestation activities will increase the production of browse and soft mast in these stands. Similarly, prescribed burning also will stimulate the production of new growth of both herbaceous and woody species. The wildlife opening renovation treatments proposed under this alternative also will result in improved habitat conditions for deer. The activities proposed, including selective herbicide application would facilitate the control of fescue and other poor quality species and allow for the establishment of clover and other desirable cool season species. These forages will provide important food sources for deer during the critical winter and early spring period.

Details of the herbicide risk assessment are summarized in Appendix B. Hazard quotients for long term exposures to contaminated vegetation were greater than 1.0 for large mammals and large birds only for triclopyr (amine) cut surface application. These hazard quotients are not of significant concern because with cut surface or injection application, the amount of non-target vegetation subject to spray deposition is very small. In addition, the scenario assumes a diet composed of 100% contaminated vegetation from the site. The diets of large mammal such as deer are highly variable and include hard and soft mast as well as green vegetation. Large mammals also typically have fairly large home ranges. The scenario also assumes that such vegetation will be consumed from the same sites for 90 consecutive days. The rate at which treated vegetation becomes unappetizing and then unavailable to foraging mammals following treatment make the assumptions proposed for this scenario quite unrealistically conservative for the project area.

Indirect Effects - Through time, the amount of mid-late successional oak forests will increase as the forests in the area mature. This should result in increased hard mast production in the area, which will benefit deer and other mast-dependent species. The underplanting of oak seedlings in the thinned white pine plantations and in the SPB damaged stands also will enhance future hard mast capability. The use of herbicides to release the planted oak seedlings will help ensure successful establishment.

Cumulative Effects – Across the Forest, implementation of the revised Forest Plan is expected to provide a diversity of habitats that will benefit white-tailed deer populations on the Forest (USDA Forest Service 2004a). The thinning, prescribed burning, reforestation and wildlife opening renovation in this alternative will enhance deer habitat on the Davenport project area. This may help offset the expected declines the quantity and quality of deer habitat on adjacent private lands due to continued residential development.

Effects of Alternative 3

Direct Effects – The effects of this alternative will be similar to alternative 2. The proposed thinning, reforestation, prescribed burning will result in improved habitat conditions for deer. Under this alternative, wildlife opening renovation would occur using mechanical methods only without the use of herbicides. Although establishment of the desired species is expected, the chance of a successful conversion of these fields using mechanical methods only are less than with the use of herbicides. Therefore benefits to deer will be more limited and shorter term.

Indirect Effects - The effects of this alternative will be similar to alternative 2. Through time, the amount of mid-late successional oak forests will increase as the forests in the area mature. This should result in increased hard mast production in the area, which will benefit deer and other mast-dependent species. The underplanting of oak seedlings in the thinned white pine plantations and in the SPB damaged stands also will enhance future hard mast capability. However, without the use of herbicides to release the planted oak seedlings, successful establishment will be less certain.

Cumulative Effects – The cumulative effects of this alternative will be similar to Alternative 2. The thinning, prescribed burning, reforestation and wildlife opening renovation in this alternative will enhance deer habitat on the Davenport project area. This may help offset the expected declines the quantity and quality of deer habitat on adjacent private lands due to continued residential development.

Element: Fuels

Measure: Changes in fuel loading, Fire Regime, and Condition Class

Bounds of Analysis: Spatial: The Davenport Mountain area, which consists of approximately 1520 acres. This area is bounded on three sides by Lake Nottely and urban

interface on the south side. **Temporal:** The condition of the project area for the next ten years.

Existing Conditions:

The 1,520 acres in the Davenport Mountain area fall into 2 Fuel Models. Fuel model 9 makes up 1,495 acres, and consist of oak, hickory, maple and other hardwood species as well as pine forest types. The second Fuel Model is Fuel Model 1 and it consists of 25 acres of wildlife fields.

Typically the fuel loading for fuel model 9 is 3 to 4 tons/acre. This consists of leaf litter and sticks < ¼ inch in diameter on the ground. A fire regime condition class (FRCC) is a classification of the amount of departure from the natural fire regime. The list below describes each level:

- Fire regime 1 is within the natural (Historical) vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances.
- Fire regime 2 would be a moderate departure from natural (Historical) vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances.
- Fire regime 3 would be a high departure from natural (Historical) vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances.
- Condition class 1 would be species composition and structures are functioning within their natural range.
- Condition class 2: Moderate increases in density, encroachment of shade tolerant tree species, or moderate loss of shade tolerant tree species caused by fire exclusion, logging, or exotic insects or disease.
- Condition class 3 is a high increases in density, encroachment of shade tolerant tree species, or moderate loss of shade tolerant tree species caused by fire exclusion, logging, or exotic insects or disease.

The overall fire regime and condition class is 3 for the Davenport Mountain area. This is a result of the limited prescribed burning that has occurred in this whole area in the past. For the condition class, there are offsite species present and limited acreage of mature, open canopy stands.

At least 60 percent of the area has been prescribed burn once and some of the area has been burn more than one. In the areas where burning has occurred, the leaf litter is around 3 tons/acre, with some white pine encroachment taking place. Overall these sites are in good shape in the fuel standpoint. In the rest of the area, fuel build-up is higher, and there is more white pine encroachment and a higher risk for catastrophic wildfire.

There are approximately 2 miles of urban interface area on the south and east side of the project area. Along and around the interface area there are pine plantations at the property

line and the fuel build-up is around 6 tons/acre or more due to SPB outbreaks. Due to the lack of prescribed burning in this area there is an abundance of fuel on the ground.

Effects of Alternative 1 (No-Action)

Direct Effects: If no action is taken fuel loading will increase over time.

Indirect Effects: With no prescribed burning, the fuel build up will be heavy with more dense undergrowth and white pine encroachment adding more available fuel. There will be a continued fuel build up in the urban interface. With no action, the fire regime and condition class will stay at a 3. This could lead to endangering the residential areas in the case of a catastrophic wildfire.

Cumulative Effects: The cumulative effects of no action will be a continued build of fuels on National Forest lands in the Davenport Mountain area. No prescribed burning or fuel management is likely on private lands. As a result fuel conditions along the wildland-urban interface will continue to deteriorate.

Effects of Alternative 2 (Proposed Action)

Direct Effects: Under this alternative, the fuel build up will temporarily increase due to timber management operation and the work around the urban interface area. However, prescribed burning will occur within 2 to 4 years of these operation which will reduce the extra fuel build cause by the timber harvest and mechanical work.

Indirect Effects: For the next 5 to 10 years, much of the area will be periodically prescribed burned. The fuel build up will be reduce after each burn, due to a reduction of the leaf litter, off site species, and ladder fuels. By opening up some of the stands, more sunlight will reach the forest floor and produce more grasses and less leaf litter. Prescribed burning this area on a three year rotation this should eliminate any major wildfires.

The proposed prescribed burns will initially change the fire regime to a 2 and then after a couple of burns it should rate out to a fire regime 1. By using timber harvest methods, a portion of the area will be improved to a condition class 2.

The firebreak construction along the wildland-urban interface will reduce the risk of catastrophic wildfire, by thinning the pine plantations so they are more open and using fire on a regular basis.

Cumulative Effects: The proposed actions will improve fuel conditions on National Forest lands in the project area. As a result fuel conditions along the wildland-urban interface also will be improved. This is especially important since, no prescribed burning or fuel management is likely on adjacent private lands.

Effects of Alternative 3

Direct Effects: It will be the same as alternative 2.

Indirect Effects: It will be the same as alternative 2.

Cumulative Effects: It will be the same as alternative 2.

ECONOMIC AND SOCIAL EFFECTS

Element - Costs and Revenues to the Government

The following tables summarize the financial analysis for comparing the “No Action” Alternative to Alternatives 2 and 3. Dollar amounts of costs and revenues are an estimate based on cost/price information in December 2004. All alternatives include costs for environmental analysis and NEPA documentation. Only the harvest alternatives have revenues associated with them. The analysis in Table 20 includes costs and benefits for the timber sale only. It does not include non-monetary benefits associated with wildlife habitat or recreation values. Tables 21-23 summarize the results for all proposed activities for each alternative.

Table 20. Summary of Commercial Thinning Project Financial Analysis

Alternative	PV-Costs	PV- Benefits	Present Net Value	Benefit/Cost Ratio
1	\$13,420	0	-\$13,420	0
2	\$46,295	\$49,780	\$3,485	1.08
3	\$46,295	\$49,780	\$3,485	1.08

1 Discount Rate = 4.0%

The following tables display economic analysis results for each alternative:

Table 21: Financial Analysis- Alternative 1

Year	Description	Quantity	PNV Cost	Benefit (\$)
0	Environmental Analysis	20 days	\$5,200	
0	Heritage Resource Survey	10 days	\$2,770	
0	Silvicultural Exams	10 days	\$2,610	
0	TES Survey	10 days	\$2,840	
	Total		\$13,420	

1 Discount Rate = 4.0%

Table 22: Financial Analysis- Alternative 2

Year	Description	Quantity	PNV Cost	Benefit (\$)
0	Environmental Analysis	20 days	\$5,200	
0	Heritage Resource Survey	10 days	\$2,770	
0	Silvicultural Exams	10 days	\$2,610	
0	TES Survey	10 days	\$2,840	
1	Cruise/ mark timber sale	784 ac.	\$26,385	
1	Sale Administration	30days/2363 ccf	\$6,490	
1	Pine pulpwood	1331 ccf		\$5,119
1	Pine sawtimber	370 ccf		\$32,019
1	Hardwood pulpwood	162 ccf		\$623
1	Hardwood sawtimber	500 ccf		\$12,019
2	Herbicide Material Cost \$22/ac	800 ac	\$16,272	
2	Herbicide Contract \$30/ac	800 ac	\$22,189	
2	Planting (labor) \$50/ac	357 ac	\$16,503	
2	Seedlings pine(\$40/m) oak(\$400/m)	17000 3200	\$629 \$1,183	
1	Reroute OHV Trail ½ mi	½ mile	\$1,923	
1	Herbicide(material) (wildlife& invasive plants) Cost\$22/ac	28	\$592	
1	Herbicide contract (wildlife& invasive plants) Cost \$60/ac	28	\$1,615	
1	Precommercial Thinning	40 ac	\$8,000	
1	Prescribe Burn 400ac. Cost \$25/ac.	400	\$9,615	
1	Construct Fish structures: Cost 100 @ \$20 ea.	20	\$1,923	
1	Refurbish wildlife openings/materials \$125/ac	20	\$2,404	
1	Refurbish wildlife openings/labor \$62.50/ac	20	\$1,202	
	Total		\$130,425*	\$49,780

1 Discount Rate = 4.0%

2

Calculations and Assumptions for Financial Analysis (Timber Sale Only)

1. Discount rate = 4%
2. Assume implementation will occur over a 1 year time frame
3. Assume harvest volume of 870 ccf sawtimber and 1493 ccf pulpwood
4. Assume average sawtimber price of \$90/ccf and average pulpwood price of \$4/ccf

* Timber sale costs are \$46,295

Timber Sale Costs:

Environmental Analysis: 20 days @\$260/day = \$5,200/ (1.04)⁰ = \$5,200
 Heritage Surveys: 10 days @ \$277/day = \$2,770/ (1.04)⁰ = \$2,770
 Silviculture Exams and Prescriptions: 10 days @ \$261/day = \$2,610/ (1.04)⁰ = \$2,610
 TES Surveys: 10 days @ \$284/day = \$2,840/ (1.04)⁰ = \$2,840
 Cruise/Mark Timber Sale: (\$35/ac, 784 ac. based on data from other forests.
 784 acres @\$35/ac = \$27,740/(1.04)¹ = \$26,385
 Sale Administration: 30 days @ \$225/day = \$6750/ (1.04)¹ = \$6,490

Costs other than timber sale:

Herbicide (material): 800 ac. @ \$22/ac= \$17,600/ (1.04)² = \$16,272
 Herbicide Contract: 800 ac. @ \$30/ac= \$24,000/ (1.04)² = \$22,189
 Planting (labor):357 ac. @ \$50/ac= \$17,850/ (1.04)² = \$16,503
 Seedlings (pine):17m @\$40/m= \$680/ (1.04)² = \$629
 (Oak) 3.2m @ \$400/m = \$1,280/ (1.04)² = \$1,183
 Wildlife Herbicide: 28 ac. @\$22/ac=\$616/ (1.04)¹=\$592
 Wildlife Herbicide Contract: 28 ac. @ \$60/ac=\$1,680/ (1.04)¹=\$1,615
 Precommercial thinning: 40 ac.@ \$200/ac = \$8,000/ (1.04)⁰ = \$8,000
 Prescribe Burn 400ac @ \$25/ac. = \$10,000/ (1.04)¹= \$9,615
 Fish Structures 100 @ \$20 ea. = \$2,000/ (1.04) = \$1,923
 Reroute OHV Trail ½ mi. = \$2,000/ (1.04) = \$1,923
 Refurbish wildlife openings (material) =\$125/ac (20 ac) = \$2,500/ (1.04)¹=\$2,404
 Refurbish wildlife openings (labor) =\$62.50/ac (20 ac) = \$1,250/ (1.04)¹=\$1,202

Table 23: Financial Analysis-Alternative 3

Year	Description	Quantity	PNV Cost	Benefit (\$)
0	Environmental Analysis	20 days	\$5,200	
0	Heritage Resource Survey	10 days	\$2,770	
0	Silvicultural Exams	10 days	\$2,610	
0	TES Survey	10days	\$2,840	
1	Cruise/ mark timber sale	784 ac.	\$26,385	
1	Sale Administration	30days/2363 ccf	\$6,490	
1	Pine pulpwood	1331 ccf		\$5,119
1	Pine sawtimber	370 ccf		\$32,019
1	Hardwood pulpwood	162 ccf		\$623
1	Hardwood sawtimber	500 ccf		\$12,019
2	Planting (labor) \$50/ac	357 ac	\$16,503	
1	Pre-Commercial Thinning	40 ac	\$8,000	
2	Seedlings pine(\$40/m) oak(\$400/m)	17000 3200	\$629 \$1,183	
2	Manual Release of Seedlings	800 acres	\$36,982	

1	Prescribe Burn 400ac. Cost \$25/ac.	400	\$9,615	
1	Construct Fish structures: Cost 100 @ \$20 ea.	100	\$1,923	
1	Refurbish wildlife openings/materials \$125/ac	20	\$2,404	
1	Refurbish wildlife openings/labor \$62.50/ac	20	\$1,202	
	Total		\$130,141	\$49,780

¹ Discount 4.0 %

Calculations and Assumptions for Financial Analysis (Timber Sale Only)

- 1 Discount rate = 4%
 - 2 Assume implementation will occur over a 1 year time frame
 - 3 Assume harvest volume of 870 ccf sawtimber and 1493 ccf pulpwood
 - 4 Assume average sawtimber price of \$90/ccf and average pulpwood price of \$4/ccf
- * Timber sale costs are \$46,295

Timber Sale Costs:

Environmental Analysis: 20 days @ \$260/day = \$5,200/ (1.04)⁰ = \$5,200

Heritage Surveys: 10 days @ \$277/day = \$2,770/ (1.04)⁰ = \$2,770

Silviculture Exams and Prescriptions: 10 days @ \$261/day = \$2,610/ (1.04)⁰ = \$2,610

TES Surveys: 10 days @ \$284/day = \$2,840/ (1.04)⁰ = \$2,840

Cruise/Mark Timber Sale: (\$35/ac, 784 ac. based on data from other forests.

784 acres @ \$35/ac = \$27,740/ (1.04)¹ = \$26,385

Sale Administration: 30 days @ \$225/day = \$6750/ (1.04)¹ = \$6,490

Costs other than timber sale:

Planting (labor): 357 ac. @ \$50/ac = \$17,850/ (1.04)² = \$16,503

Precommercial thinning: 40 ac. @ \$200/ac = \$8,000/ (1.04)⁰ = \$8,000

Seedlings (pine): 17m @ \$40/m = \$680/ (1.04)² = \$629

(Oak) 3.2m @ \$400/m = \$1,280/ (1.04)² = \$1,183

Manual release of seedlings: 800 acres @ \$50/ac. = \$40,000/ (1.04)² = \$36,982

Prescribe Burn 400ac @ \$25/ac. = \$10,000/ (1.04)¹ = \$9,615

Fish Structures 20 @ \$100 ea. = \$2,000/ (1.04) = \$1,923

Refurbish wildlife openings (material) = \$125/ac (20 ac) = \$2,500/ (1.04)¹ = \$2,404

Refurbish wildlife openings (labor) = \$62.50/ac (20 ac) = \$1,250/ (1.04)¹ = \$1,202

Element: Recreation

This section will address the effects of the various alternatives on motorized and non-motorized recreation use in the project area.

Measure: Use by OHV riders, hunters, anglers, and dispersed campers.

Bounds of Analysis: Spatial: The approximately 1,520 acres of the project area and the 5 mile Davenport OHV Trail. **Temporal:** The recreational use of the project area over the next ten years.

Existing Conditions

The management prescription for the project area is 7E.1-Dispersed Recreation. The Davenport Mountain area recreation use primarily consists of OHV riders on the 5 mile Davenport Mountain OHV Trail, a segment of which runs concurrently with FS 143-A, large and small game hunting, and some dispersed camping along FS 143-A and around the shore of Lake Nottely. No developed recreation opportunities exist in the project area with the exception of the OHV trail. Some illegal OHV use takes place via user-created trails, particularly when the area is closed for the winter months. Other outdoor-related recreation uses are minimal.

Effects of Alternative 1 (No Action)

Direct Effects: If no action is taken, recreational opportunities and use patterns will remain essentially the same.

Indirect Effects: Same as Direct Effects.

Cumulative Effects: Same as Direct Effects.

Effects of Alternative 2

Direct Effects: The thinning, stand restoration, and reforestation activities proposed in this alternative would necessitate either partial or complete closure of the Davenport Mountain OHV trail during the implementation phase of those activities. OHV users will have less opportunity to engage in this activity while all or portions of the trail are closed for the project activity. Mitigation of this loss of opportunity will include performing some or all of the project work during the period when the trail is normally closed during the winter, and providing information on other OHV opportunities in the area. Use of portions of the trail as haul or skid roads will change the track width and dip profile of the trail. Mitigation of this change will be done by reshaping the dips and wing ditches and narrowing the track width where necessary after the project work is completed. Some hunting activity and associated dispersed camping might be limited during the period the work is being performed. No direct recreation effects are expected from the construction

of an urban interface firebreak. Hunting and fishing opportunities would be enhanced by the construction of fish attractors and renovation of wildlife openings. User conflicts between OHV riders and general motorized road traffic would be reduced by rerouting the OHV off the segment of FS 143-A that is currently open to both OHV's and general motorized traffic. One road crossing of FS 143-A would be incorporated in the reroute. No stream crossings would be involved with the reroute.

Indirect Effects: Greatly reducing stem density and other actions associated with the vegetation management aspect of this alternative will have the potential of increasing illegal OHV use in this area, along with the opening of haul and skid routes. Open understory is traditionally inviting to off-trail OHV use. This will be mitigated by pulling slash into all haul and skid routes within line-of-sight of the OHV trail, not to exceed 200 feet, well-constructed tank traps, increased signing, and increased compliance checks. Firebreaks along the urban interface will potentially increase illegal OHV use for the same reasons mentioned above. Mitigation will include increased signage, compliance checks, and possibly some tank-trapping. An increase in soft mast and browse as the area is changed in character might offer long term increases in hunting opportunities. Closure of all or portions of the OHV trail during project work might lead to increased illegal OHV use by users seeking to bypass the closed sections. Mitigation of this would include increased signage, increased compliance checks, and moveable barricades across the closed portions of the trail.

Cumulative Effects: The actions proposed in this alternative will not significantly change the type or volume of the recreation activities in the surrounding area or the district as a whole.

Effects of Alternative 3

Direct Effects: Essentially the same as those in Alternative 2.

Indirect Effects: Essentially the same as those in Alternative 2.

Cumulative Effects: Essentially the same as those in Alternative 2.

Element: Public Health and Safety

The following issues of public health and safety will be addressed: the use and application of herbicides, the use of prescribe fire, timber harvesting safety and ATV use conflicts on open system road.

Measure: Measure will consist of the types of herbicide to be used, the application rates and the number of acres to be treated, prescribed burning procedures, timber harvesting operations and reroute of ATV trail.

Bounds of Analysis: **Spatial:** Public health and safety issues will be analyzed for the Davenport Mountain area and adjacent private lands. **Temporal:** Public health and safety issues related to project activities that will occur for the next ten years.

Existing Conditions:

The Davenport Mountain area receives a lot of recreational use such as hunting, fishing in Lake Nottely and ATV riding on the Davenport Mt. ATV Trail. The southern portion of the area is bounded by residential areas.

Effects of Alternative 1 (No Action)

Direct Effects: If no action is taken conditions will remain the same as now. There will still be user conflicts and potential safety issues on the section of ATV trail that runs concurrent with the system road. There would be no direct effects on safety regarding timber harvest, herbicide use or prescribed burning since none of these activities would occur.

Indirect Effects: With no action taken there will be a continued fuel build up in the urban interface. This could lead to endangering the residential areas in the case of a catastrophic wildfire.

Cumulative Effects: There will be no cumulative effects on public safety from the no action alternative.

Effects of Alternative 2 (Proposed Action)

Direct Effects - Effects of all herbicides have been assessed in the Final Environmental Impact Statement for Vegetation Management in the Appalachian Mountains (VMEIS). For all herbicides considered, an additional risk analysis was completed using methodology developed for the Forest Service by Syracuse Environmental Research Associates (SERA). In the risk assessments, there are two terms not used in the VMEIS. These are Reference Dose (RfD) and Hazard Quotient (HQ).

- **RfD** - Derived by USEPA, this is the maximum dose in mg of herbicide active ingredient (a.i.) per kg of body weight per day that is not expected to cause injury over a lifetime of exposure. In other words, it is, in EPA's opinion, a "safe" lifetime daily dose. This is a conservative estimate, and is designed to be protective.
- **HQ** - This is the ratio of the estimated exposure dose to the RfD. A HQ of 1 reflects an exposure to amounts of a.i. equal to the RfD; HQs less than 1 reflect exposures to amounts of a.i. less than the RfD, while HQs greater than 1 reflect exposures to amounts of a.i. greater than the RfD. *HQs of 1.0 or less reflect exposure levels that are not of concern.* HQs greater than 1.0 reflect exposures to possible effects to be examined more closely to see if the projected exposures need to be further mitigated or need to be avoided. For the effects on wildlife, one must remember that these effects are constructed for individuals and not populations.

For Alternative 2, the spill plan in Appendix C would be in place. Alternative 2 also assumes that all of the mitigation measures in Appendix A of this document would be followed, as would mitigation measures in the VMEIS. Published analyses of environmental effects in the VMEIS are not duplicated in this document. However, information published subsequent to the VMEIS encountered in the open literature that is both relevant to this analysis and demonstrates a potential for significant effect on the conclusions drawn in the VMEIS has been included in the current analysis.

The following tables show the basis for estimated application rates that are used in the risk analysis:

Table 24. Herbicide Application Rate Assumptions

Cut (severed) stems and streamline applications

Herbicide	Lbs ai/gal	% (fraction) in solution	Gallons of spray/acre	Lbs ai/acre
Glyphosate	5.4	50.0%	0.65	1.8
Triclopyr (amine)	3.0	50.0%	2.5	3.75
Triclopyr (ester)	4.0	20%	1.0	0.8*

*see results for triclopyr ester at 1.4 lbs/ac

Foliar Spray Applications

Herbicide	Lbs ai/gal	% (fraction) in solution	Gallons of spray/acre	Lbs ai/acre
Triclopyr (ester)	4.0	2.0%	15	1.4
Imazapyr	2.0	0.39%	15	0.1
Glyphosate	5.4	1.0%	30	1.6*

*See results for Glyphosate at 1.8 lbs/ac

For each herbicide, hazard quotients are developed that summarize risk characteristics for workers, the general public, terrestrial animals and aquatic species. For this analysis, hazard quotients derived from spill scenarios into ponds have been set to zero. The reason is that the project has mitigation measures in place (Appendix A) that make such spills so unlikely that such an analysis would be irrelevant. In addition, in the unlikely event this should occur, expedited clean up and exclusion from use are required until clean up has been accomplished. The specific spill scenario referenced is: acute/accidental exposure, contaminated water consumed by a child (EO4 sheet).

Hazard quotients for the general public involving direct spray exposures to the entire body or lower legs are also considered so unlikely as to be irrelevant. These have also been set to zero.

Following is a summary of the findings from this assessment for values over 1.0. A complete summary of results of the risk assessment is in Appendix B of this document.

The most important hazard quotient is the general exposure HQ for workers. These are the people most likely to have direct exposure to herbicides. According to the Forest

Service Southern Region Pesticide Specialist, the central HQ best reflects a realistic upper exposure and risk for workers using required personal protective equipment and employing proper washing and hygiene habits. Rapid personal cleanup in the event of any exposure should keep the dosage internalized (the hazard) in the typical, rather than the upper bound range.

Results of the risk assessment for typical exposures of glyphosate at 1.8 lbs/acre are well under 1.0 (see project file) indicating low risk. For imazapyr, none of the hazard quotients calculated for risks to workers or the general public, were above 1.0.

For both the amine and ester formulation of triclopyr, results of the risk assessment found that typical exposures of workers to directed ground spray (backpack) were 1.0 or less. Although *upper* exposures were calculated above 1.0 for general exposure of workers using a backpack and for a spill on the lower legs to a worker (triclopyr amine), the central HQ best reflects a realistic upper exposure and risk for workers using appropriate personal protective equipment and employing proper washing and hygiene habits according to the Forest Service Southern Region Pesticide Specialist.

For the amine formulation of triclopyr, results of the hazard quotients calculated for chronic/long term exposure of a woman to contaminated fruit is above 1.0 at an *upper* bound. Typical exposures are less than 1.0. The upper bound exposures are most unlikely for the following reasons:

- Herbicide application areas are signed to preclude accidental exposure.
- The scenario assumes that for a long term exposure to occur contaminated fruit is eaten 90 days in a row.
- Blackberries, the only types of fruit likely to be available in any substantial quantity, would not continue to ripen for more than approximately one week after treatment. After that time, they would be unavailable to berry foragers.

For both the amine and ester formulation of triclopyr, typical hazard quotients for vegetation contact of an adult female in shorts and a t-shirt are above 1.0. Lower levels are at or below 1.0. However, herbicide application areas are signed to preclude accidental exposure.

Accidental exposure of a worker to contaminated gloves shows a typical HQ of 1.1 triclopyr (ester formulation) at 1.4 lbs/acre. This is unlikely to occur because the scenario assumes that the contaminated glove will be left on the hands in direct contact with the skin for 1 hour. Labeling instructions and worker protection standards require proper hygiene. Contaminated gloves should be removed immediately and both the contaminated skin and gloves should be washed with an appropriate soap or detergent, and water.

The use of protective clothing can substantially reduce worker doses. Protective clothing can reduce worker exposures by 27 to 99 percent, as shown in a number of field studies

of worker exposure (VMEIS, Volume II, Appendix A, page 5-35). Workers would be required to wear all personal protective and safety equipment required by labeling. A change of clothes as well as soap, wash water, eyewash bottles and first aid equipment would also be provided on-site.

While workers are more likely to be exposed to the herbicide than the general public, the risk to workers (systemic and reproductive) from ground based spraying application of these herbicides at typical rates is low (VMEIS, Volume 1, Chapter IV, page IV-18).

As a result of these analyses, and given that Forest Plan Standards, project mitigation, and assumptions are met, there should be no significant negative effect to human health or safety as a result of herbicide use in this alternative.

One potential danger of prescribed fire would be the escape onto private property. All standard mitigations for prescribed fire operations would be followed to prevent this from happening. All personnel involved in the actual firing operations will be fully trained and equipped with all the required personal protective equipment. Prescribed burning produces some particulate emissions which impair visibility and can have an adverse impact on human health. Particulate matter emission would be greatly reduced by burning under conditions that enhance flaming and reduce smoldering. Burning when atmospheric conditions are most conducive to smoke dispersion would lessen the effects of particulate matter on smoke-sensitive areas.

There would be a risk of injury to forest workers engaged in timber falling, limbing, and bucking from the use of chainsaws and from falling trees or limbs. There would be risk of injury to forest workers and equipment operators from log skidding and loading operations. These risks would be reduced by the use of personal protective equipment normally used during logging and other forest work activities, such as hardhats, gloves, work boots, chainsaw chaps, and eye and ear protection. There would be a risk for vehicular accidents on the roads resulting from log truck traffic hauling products off the national forest. Appropriate posting of warning signs at the national forest gates would be mandated by the Forest Service if the proposal is implemented.

The problem of mixing ATV's and regular vehicles on the ½ mile section of the system road will be eliminated due to relocation of the ATV trail.

Indirect Effects - There will be no indirect effects to adjacent areas from herbicide usage due to the mitigation measures that will be taken to minimize drift and effects to non-target vegetation (see Appendix A).

Prescribed burning can have an indirect effect of smoke, especially if burning under unsuitable conditions. Forest Service standards only allow for burning under optimum conditions which would mitigate these indirect effects. Likelihood for a catastrophic wildfire to escape onto private lands would be reduced due to the thinnings and the construction of the fire break. If a fire was to occur, there would be a reduced volume of smoke as a result of the thinnings.

Cumulative Effects: The potential effects to health and safety would be similar in type and extent from those associated with previous projects across the district and would not be significant.

The use of herbicides carries some risks to human health and safety, particularly to the applicator. This risk is reduced by requiring the applicator to be trained in safety precautions, proper use, and handling of herbicides. Other factors reducing the risk of herbicide use to human health and safety is the low level of active ingredient per acre and placement of notice signs posted in areas where herbicide has been applied. The signs include information on the herbicide used, when it was applied, and who to contact for additional information (see also Appendix A, Standard Mitigation Measures for Herbicide Use).

All standards in the current Forest Plan which relate to herbicide use will be met. An Emergency Spill Plan that outlines procedures to be followed in the event of an accidental spill is included in Appendix C. The Emergency Spill Plan also contains information on providing care to persons who are exposed to a spill.

In cut surface treatment, herbicide is applied directly to a freshly cut stump in an amount that will not run off. The herbicide is rapidly absorbed into the stump and is dry within an hour of treatment. When applied at the required typical rate, these herbicides pose an insignificant risk (systemic and reproductive) to the public either from dietary exposure (water, fish, meat, vegetable, foraged berry) or dermal exposure (on-site or drift) (VMEIS, Volume 1, IV-16). To mitigate any possible contact with the public, dye is added to the herbicide and warning signs are placed in all treatment areas.

Cumulative effects that might result from the use of herbicides on private land are difficult to assess. The use of herbicides on private land is generally for the control of woody plants near homes. No other herbicide use is currently proposed within the project area or anticipated to occur within the near future. . The treatments are also proposed for implementation over a 3 –5 year period of time. For these reasons and because the effects to human health and safety are likely to be small, Alternative 2 will result in few or no cumulative impacts to human health and safety.

Effects of Alternative 3

Direct Effects – The direct effects of this alternative will be similar to Alternative 2. The A portion of FS system road 143-A will be closed to regular vehicular traffic and left as an ATV trail only. This will eliminate the safety issue relate to mixed traffic that currently exists.

No herbicides will be used in this alternative for site preparation, or invasive species control. Other means of control such as prescribed fire and manual methods. Where manual methods are used, repeated treatments on sites with high numbers of competing stems are necessary in order to successfully release or precommercially thin pine and

hardwood seedlings or saplings due to the rapid growth of single and multiple sprouts on most cut hardwood stems.

The VMEIS presents data which shows conclusively that manual methods of vegetation control, including chainsaw felling, brush axe cutting, and other handtools, have by far the greatest frequency of accidents and pose the highest risk of serious injury or death to forest or contract workers (VMEIS Volume I, table IV-7).

Elimination of herbicides slightly improves public health and safety. However, increased use of manual methods to treat the same number of acres would cause a net increase in risk to worker safety with negligible human health risk reduction. (VMEIS IV-153).

In most of the stands there is sufficient competition from species such as sourwood, poplar, and maple that would compete heavily with the pine or oak trees desired on the site. Manual treatments will do nothing to retard hardwood sprouting. Without the use of herbicides prolific sprouters would prevail on many sites at the detriment of desired oak and pine trees. As a consequence, stand species composition will shift towards more tolerant species such as dogwood and oak. Alternative 2 would not allow regrowth of the treated stems which are competing with desired species. However, under Alternative 3 because of the re-sprouting of the treated stems the treatment would need to be repeated every two years, at least three times.

Indirect Effects – Indirect effects of this alternative will be similar to Alternative 2.

Prescribed burning can have an indirect effect of smoke, especially if burning under unsuitable conditions. Forest Service standards only allow for burning under optimum conditions which would mitigate these indirect effects. Likelihood for a catastrophic wildfire to escape onto private lands would be reduced due to the thinnings and the construction of the fire break. If a fire was to occur, there would be a reduced volume of smoke as a result of the thinnings. There will be no herbicide use under this alternative.

Cumulative Effects – The cumulative effects of this alternative will be similar to Alternative 2. The potential effects to health and safety would be similar in type and extent from those associated with previous projects across the district and would not be significant. There will be no herbicide use on National Forest lands under this alternative, although household use on adjacent private lands likely would continue.

OTHER CONSIDERATIONS

Consumers, Civil Rights, Minority Groups, and Women

Consumers or users of the project area would be affected as detailed in the physical, biological, economic and social effects analysis. Users of the Davenport Mountain OHV area will be temporarily affected due to the closure of the area during the timber harvest operations. However, providing a separate travel way for OHV users and other vehicular traffic will enhance long-term safety and enjoyment of the trail. Hunters as users should see increases in game populations including wild turkey, white-tailed deer, and bobwhite quail as well as songbirds and small mammals. Anglers will see enhanced fishing

opportunities in Lake Nottely. Sightseers would see a short-term increase in contrast the harvest operations for approximately three to five years. Wildflowers, green sprouts from most species of trees and shrubs, and other forbs and vines would grow vigorously with the increase in sunlight created by the harvesting.

The civil rights of individuals or groups, including women, would not be affected under the proposed action or any of the alternatives. There are no actions or methods of actions that would affect any one group or individual any differently than others.

Irreversible and Irretrievable Effects

An irreversible commitment of resources results from a decision to use or modify resources when they are renewable only over a long period of time, such as soil productivity; or are nonrenewable resources, such as cultural resources or minerals (Final Environmental Impact Statement (FEIS) for the Forest Plan, page 3-648). There are no irreversible commitments of resources in the initial proposed action or alternatives to the initial proposal:

- Reports from archeological surveys conducted by professional archeologists have concluded that there will be no impact to properties eligible for listing on the National Register of Historic Places that are known to occur within the project area.
- Implementation of the proposed action or the alternatives to it would not have any long-term effect on soil productivity.

An irretrievable commitment of resources is the loss of production or human use of renewable resources (FEIS for the Forest Plan, page 3-649). This represents opportunities forgone for the period of time that the resource cannot be used. An example of an irretrievable commitment includes harvesting planned in the proposed action (Alternative 2) as well as the Alternative 3 where the existing timber volume is lost and then is gradually replaced as new trees or reserve trees grow and re-occupy the growing space. Another example would be some skid trails may lose production of trees for a short period of time when grasses are sowed on those exposed soils, causing a short-term irretrievable loss of tree growth.

Irretrievable commitments are not listed in full here, but are disclosed in detail throughout the Environmental Consequences chapter.

APPENDICES

APPENDIX A. STANDARD MITIGATION MEASURES FOR HERBICIDE USE

1. Herbicides are applied according to labeling information and the site-specific analysis done for projects. This labeling and analysis are used to choose the herbicide, rate, and application method for the site. They are also used to select measures to protect human and wildlife health, non-target vegetation, water, soil, and threatened, endangered, proposed, and sensitive species. Site conditions may require stricter constraints than those on the label, but labeling standards are never relaxed.
2. Only herbicide formulations (active and inert ingredients) and additives registered by EPA and approved by the Forest Service for use on national forests are applied.
3. Public safety during such uses as viewing, hiking, berry picking, and fuelwood gathering is a priority concern. Method and timing of application are chosen to achieve project objectives while minimizing effects on non-target vegetation and other environmental elements. Selective treatment is preferred over broadcast treatment.
4. Areas are not prescribed burned for at least 30 days after herbicide treatment.
5. A certified pesticide applicator supervises each Forest Service application crew and trains crew members in personal safety, proper handling and application of herbicides, and proper disposal of empty containers.
6. Each Contracting Officer's Representative (COR), who must ensure compliance on contracted herbicide projects, is a certified pesticide applicator. Contract inspectors are trained in herbicide use, handling, and application.
7. Contractors ensure that their workers use proper protective clothing and safety equipment required by labeling for the herbicide and application method.
8. Notice signs (FSH 7109.11) are clearly posted, with special care taken in areas of anticipated visitor use.
9. Triclopyr is not ground-applied within 60 feet, of known occupied gray bat habitat. Buffers are clearly marked before treatment so applicators can easily see and avoid them.
10. No herbicide is ground-applied within 60 feet of any known threatened, endangered, proposed, or sensitive plant. Buffers are clearly marked before treatment so applicators can easily see and avoid them. Selective applications to control competing vegetation within this buffer designated to protect TES plants may occur when needed to protect the TES plants from encroachment by invasive plants and when a non-soil active herbicide is used.
11. Application equipment, empty herbicide containers, clothes worn during treatment, and skin are not cleaned in open water or wells. Mixing and cleaning water must come from a public water supply and be transported in separate labeled containers.
12. No herbicide is ground-applied within 100 horizontal feet, of lakes, wetlands, or perennial or intermittent springs and streams. No herbicide is applied within 100

horizontal feet of any public or domestic water source. Selective treatments (which require added site-specific analysis and use of aquatic-labeled herbicides) may occur within these buffers only to prevent significant environmental damage such as noxious weed infestations. Buffers are clearly marked before treatment so that applicators can easily see and avoid them.

13. Herbicide mixing, loading, or cleaning areas in the field are not located within 200 feet of private land, open water or wells, or other sensitive areas
14. During use, equipment to store, transport, mix, or apply herbicides is inspected daily for leaks.
15. Herbicides and application methods are chosen to minimize risk to human and wildlife health and the environment. No class B, C, or D chemical may be used on any project, except with Regional Forester approval. Approval will be granted only if a site-specific analysis shows that no other treatment would be effective and that all adverse health and environmental effects will be fully mitigated. Diesel oil will not be used as a carrier for herbicides, except as it may be a component of a formulated product when purchased from the manufacturer. Vegetable oils will be used as the carrier for herbicides when available and compatible with the application proposed.
16. Herbicides are applied at the lowest rate effective in meeting project objectives and according to guidelines for protecting human (NRC 1983) and wildlife health (EPA 1986a). Application rate and work time must not exceed levels that pose an unacceptable level of risk to human or wildlife health. If the rate or exposure time being evaluated causes the Margin of Safety (MOS) or the Hazard Quotient (HQ) computed for a proposed treatment to fail to achieve the current Forest Service R-8 standard for acceptability (acceptability requires a MOS > 100 or a HQ of < 1.0 using the most current of the SERA or Risk Assessments found on the Forest Service website). Additional risk management must be undertaken to reduce unacceptable risks to acceptable levels, or an alternative method of treatment must be used.
17. Weather is monitored and the project suspended if temperature, humidity, or wind becomes unfavorable for correct application as shown in Table 1.

Table 1. Weather Restrictions for Herbicide Application

Application Method	Temperatures Higher Than	Humidity Less Than	Wind (at target) Greater Than
Ground:			
Hand (cut surface)	N.A.	N.A.	N.A.
Hand (other)	98°F	20%	15 mph
Mechanical:			
Liquid	95°F	30%	10 mph
Granular	N.A.	N.A.	10 mph
Aerial:			
Liquid	90°F	50%	5 mph
Granular	N.A.	N.A.	8 mph

18. Nozzles that produce large droplets (mean droplet size of 50 microns or larger) or streams of herbicide are used. Nozzles that produce fine droplets are used only for hand treatment where distance from nozzle to target does not exceed 8 feet.

19. Pesticide mixing, loading, or cleaning areas in the field are located at least 50 feet from ephemeral streams.
20. No-soil active herbicide with half-life longer than three months is broadcast within 25 feet of ephemeral streams. Selective treatments with aquatic-labeled herbicides are allowed. Such areas are clearly marked before treatment so that applicators can easily see and avoid them.
21. No herbicide is broadcast within 100 feet of private land or 300 feet of a private residence, unless the landowner agrees to closer treatment. Buffers are clearly marked before treatment so applicators can easily see and avoid them.
22. **Project-level Mitigation** - No herbicide is ground-applied within 60 feet of any known locally rare plant (Indian Paintbrush, Climbing Fern, Rough Sedge). Buffers are clearly marked before treatment so applicators can easily see and avoid them. Selective applications to control competing vegetation within this buffer designated to protect locally rare plants may occur when needed to protect the locally rare plants from encroachment by invasive plants and when a non-soil active herbicide is used.

APPENDIX B. RESULTS OF THE RISK ASSESSMENT – DETAILED SUMMARY

Effects of all herbicides have been assessed in the Final Environmental Impact Statement for Vegetation Management in the Appalachian Mountains (VMEIS). For all herbicides considered, an additional risk analysis was completed using methodology developed for the Forest Service by Syracuse Environmental Research Associates (SERA). The details of the risk assessment results are available in the project record. In the risk assessments, there are two terms not used in the VMEIS. These are Reference Dose (RfD) and Hazard Quotient (HQ).

- **RfD** - Derived by USEPA, this is the maximum dose in mg of herbicide active ingredient per kg of body weight per day that is not expected to cause injury over a lifetime of exposure. In other words, it is, in EPA’s opinion, a “safe” lifetime daily dose. This is a conservative estimate, and is designed to be protective.
- **HQ** - This is the ratio of the estimated exposure dose to the RfD. A HQ of 1 reflects an exposure to amounts of a.i. equal to the RfD; HQs less than 1 reflect exposures to amounts of a.i. less than the RfD, while HQs greater than 1 reflect exposures to amounts of a.i. greater than the RfD. *HQs of 1.0 or less reflect exposure levels that are not of concern.* HQs greater than 1.0 reflect exposures to possible effects to be examined more closely to see if the projected exposures need to be further mitigated or need to be avoided. For the effects on wildlife, one must remember that these effects are constructed for individuals and not populations.

For Alternative 2, the spill plan in Appendix C would be in place. Alternative 2 also assumes that all of the mitigation measures in Chapter 2 and Appendix A of this document would be followed, as would mitigation measures in the VMEIS. Published analyses of environmental effects in the VMEIS are not duplicated in this document. However, information published subsequent to the VMEIS encountered in the open literature that is both relevant to this analysis and demonstrates a potential for significant effect on the conclusions drawn in the VMEIS has been included in the current analysis.

The following tables show the basis for estimated application rates that are used in the risk analysis:

Herbicide Application Rate Assumptions

Cut (severed) stems and streamline applications

Herbicide	Lbs ai/gal	% (fraction) in solution	Gallons of spray/acre	Lbs ai/acre
Glyphosate	5.4	50.0%	0.65	1.8
Triclopyr (amine)	3.0	50.0%	2.5	3.75
Triclopyr (ester)	4.0	20%	1.0	0.8*

*See results for triclopyr ester at 1.4 lbs/ac

Foliar Spray Applications

Herbicide	Lbs ai/gal	% (fraction) in solution	Gallons of spray/acre	Lbs ai/acre
Triclopyr (ester)	4.0	2.0%	15	1.4
Imazapyr	2.0	0.39%	15	0.1
Glyphosate	5.4	1.0%	30	1.6*

*See results for Glyphosate at 1.8 lbs/ac

For each herbicide, hazard quotients are developed that summarize risk characteristics for workers, the general public, terrestrial animals and aquatic species. For this analysis, hazard quotients derived from spill scenarios into ponds have been set to zero. The reason is that the project has mitigation measures in place (Appendix A) that make such spills so unlikely that such an analysis would be irrelevant. In addition, in the unlikely event this should occur, expedited clean up and exclusion from use are required until clean up has been accomplished. The specific spill scenario referenced is: acute/accidental exposure, contaminated water consumed by a child (EO4 sheet).

Hazard quotients for the general public involving direct spray exposures to the entire body or lower legs are also considered so unlikely as to be irrelevant. These have also been set to zero.

The most important hazard quotient is the general exposure HQ for workers. These are the people most likely to have direct exposure to herbicides. According to the Forest Service Southern Region Pesticide Specialist, the central HQ best reflects a realistic upper exposure and risk for workers using required personal protective equipment and employing proper washing and hygiene habits.

The herbicides considered for use in this EA are glyphosate, triclopyr, and imazapyr. Hazard quotients were calculated for the estimated application rates for this project. HQ's over 1.0 are discussed below.

Glyphosate, injection or cut stump treatment @ 1.8 lbs/acre

Glyphosate was analyzed under two situations, with and without the use of a surfactant. Because the use of a surfactant (most commonly a detergent) would slightly increase any toxicity, those results are reported here.

Results for typical exposures of glyphosate are all less than 1.0 for human health.

Wildlife G03 sheet, acute exposure hazard quotients to fish, aquatic invertebrates and aquatic macrophytes for accidental spills have calculated values over 1.0. Such exposures and risk are most unlikely for glyphosate. This is because glyphosate is strongly adsorbed to (bound to the surface of) both organic matter and clay particles. Therefore it is very immobile in the environment, and unlikely to reach aquatic habitat.

Even in the unlikely event that it might reach such habitat, it would probably be quickly bound to sediment or organic matter in the stream. In addition, with the provision of riparian buffer strips on stream zones, the risk is further reduced. This includes a standard that prohibits herbicide application within 100 horizontal feet of lakes, wetlands, or perennial or intermittent springs and seeps (FW standard FW-022).

For drift exposure from a low boom application of glyphosate, hazard quotients for terrestrial plants are above 1.0 for species that are directly sprayed. This type of application would be used to improve existing wildlife fields by spraying fescue and replanting with other more desirable species. The effects of the direct spray on the fescue are the desired outcome of this treatment. Mitigation measures will ensure that direct spray of non-target vegetation will be minimized. This includes a standard that prohibits herbicide application within 60 feet of any known threatened, endangered, or sensitive plant (FW standard FW-019). In addition, a project level mitigation measure has been included that provides this same 60 foot buffer distance for locally rare plants.

Triclopyr (amine), cut surface application @ 3.75 lbs/acre

Human health E02 sheet, directed ground spray (backpack), general exposure for workers, *upper* bound HQ = 6.0 and *upper* bound for spill on lower legs is 1.7. Typical exposures are 1.0 or less. However, the upper bound exposure is most unlikely for the following reason:

- According to the Forest Service Southern Region Pesticide Specialist, the central HQ best reflects a realistic upper exposure and risk for workers using appropriate personal protective equipment and employing proper washing and hygiene habits. Forest Service personnel are required to follow these safety protocols whenever applying pesticides.

Rapid personal cleanup in the event of any exposure should keep the dosage internalized (the hazard) in the typical, rather than the upper bound range. Human health E04 sheet, long term exposure for women, contaminated fruit, *upper* bound HQ = 1.7. Typical exposures are less than 1.0 at a value of 0.1. The upper bound exposures are most unlikely for the following reasons:

- Herbicide application areas are signed to preclude accidental exposure.
- The scenario assumes that for a long term exposure to occur contaminated fruit eaten 90 days in a row.
- Blackberries, the only types of fruit likely to be available in any substantial quantity, would not continue to ripen for more than approximately one week after treatment. After that time, they would be unavailable to berry foragers.

The typical HQ for vegetation contact of an adult female in shorts and a t-shirt is 3.0 and the lower level is 1.0. However, herbicide application areas are signed to preclude accidental exposure.

Wildlife G02 sheet, consumption of contaminated vegetation by a large mammal and large bird, shows typical HQs of 1.9 and 1.5, respectively. These hazard quotients are not of significant concern because:

- With cut surface or injection application, the amount of non-target vegetation subject to spray deposition is very small
- There are no threatened or endangered large mammal species in the project vicinity. Bald eagles are occasionally observed foraging on Lake Nottely but there currently are no known bald eagle nests anywhere on the Lake Nottely, including the Davenport Mountain area. Bald eagles forage for fish and do not consume vegetation. Therefore they would be unlikely to come in contact with the treated vegetation. Treatment buffers along streams and lakes will reduce the risk of herbicides entering Lake Nottely. Hazard quotients for fish-eating birds such as eagles are well below 1.0, even at upper levels of exposure.
- The scenario assumes a diet composed of 100% contaminated vegetation from the site. The diets of large mammal and birds such as deer and turkey are highly variable and include hard and soft mast (deer and turkeys), insects and seed (turkey) as well as green vegetation. Large mammals and large birds also typically have fairly large home ranges. The scenario also assumes that such vegetation will be consumed from the same sites for 90 consecutive days. The rate at which treated vegetation becomes unappetizing and then unavailable to foraging mammals and birds following treatment make the assumptions proposed for this scenario quite unrealistically conservative for the project area.
- These HQs deal with individuals, not wildlife populations. Although an individual may be affected there won't be significant effects to the population.

Although there are upper level values above 1.0 for small mammals eating a contaminated insect and large mammals eating grass, the typical values are all less than 1.0. Typical values represent the most likely situation.

In addition to the effects described above, direct effects to birds or mammals are unlikely since these species are likely to move from the area when project activities are implemented. Although direct effects to amphibians are more likely since contact with herbicide could be absorbed through the skin and effect metabolic activity, amphibians are likely to be under logs, rocks or leaves, making direct contact with chemicals less likely. Direct effects to other non-target plants occurring in these habitats could occur. Application methods, including direct application to target foliage or freshly cut stumps, would minimize the possibility for spills and/or direct contamination to non-target species.

Wildlife G03 sheet, the exposure HQ for aquatic plants and algae are greater than 1.0 for accidental spills. These are not of concern because:

- With the provision of riparian buffer strips around streams, the risk of herbicide spills or movement into streams is further reduced.

- Mixing and dilution in active streams will minimize any potential hazard from any small spills which might occur during implementation of this project.

Hazard quotients for exposure of terrestrial vegetation from runoff of triclopyr amine have hazard quotients greater than 1.0 in areas with more than 25 inches of rainfall per year. These values vary depending on the average annual rainfall in a given area and the scenarios assume that rain falls every 10 days. The typical value for an area with 50 inches of annual rainfall is 1.4. However, all proposed herbicide applications are to be applied directly to the targeted vegetation; therefore by correctly following application procedures, impacts to non-targeted species would be minimal. Although some loss of terrestrial plants could possibly occur, there are mitigation measures already in place to protect sensitive species so overall effects should be minimal.

Triclopyr (ester), foliar application @ 1.4 lbs/acre

This will be applied in a mix containing 3oz triclopyr ester and 0.5 oz imazapyr and is applied lightly over the top to just speckle the vegetation. This mixture uses less active ingredient per acre than a formulation containing only triclopyr. The analysis was run at an estimated maximum application rate. Typical applications would use less than 1.4 lbs/acre.

Human health E02 sheet, directed ground spray (backpack), general exposure for workers, *upper* bound HQ = 2.0. Typical exposures are less than 1.0 at a value of 0.4. However, the upper bound exposure is most unlikely for the following reason:

- According to the Forest Service Southern Region Pesticide Specialist, the central HQ best reflects a realistic upper exposure and risk for workers using appropriate personal protective equipment and employing proper washing and hygiene habits. Forest Service personnel are required to follow these safety protocols whenever applying pesticides.

Human health E02 sheet, accidental exposure of a worker to contaminated gloves shows a typical HQ of 1.1. This is unlikely to occur because the scenario assumes that the contaminated glove will be left on the hands in direct contact with the skin for 1 hour. Labeling instructions and worker protection standards require proper hygiene. Contaminated gloves should be removed immediately and both the contaminated skin and gloves should be washed with an appropriate soap or detergent, and water skin rinsed with water if contaminated.

The typical HQ for vegetation contact of an adult female in shorts and a t-shirt is 1.9 and the lower level is less than 1.0. However, herbicide application areas are signed to preclude accidental exposure and the scenario assumes contact occurs while the vegetation is still wet.

Wildlife G02 sheet, longer term exposure (90 days) of a large bird or large mammal to contaminated vegetation on site, had *upper* level HQ's above 1.0. Typical values were less than 1.0. The upper level hazard quotient is not a concern for the following reasons:

- There are no threatened or endangered large mammal species in the project vicinity. Bald eagles are occasionally observed foraging on Lake Nottely but there currently are no known bald eagle nests anywhere on the Lake Nottely, including the Davenport Mountain area. Bald eagles forage for fish and do not consume vegetation. Therefore they would be unlikely to come in contact with the treated vegetation. Treatment buffers along streams and lakes will reduce the risk of herbicides entering Lake Nottely. Hazard quotients for fish-eating birds such as eagles are well below 1.0, even at upper levels of exposure.
- The scenarios assume a diet composed of 100% contaminated vegetation from the site. The diets of large mammal and birds such as deer and turkey are highly variable and include hard and soft mast (deer and turkeys), insects and seed (turkey) as well as green vegetation. Large mammals and large birds also typically have fairly large home ranges. The scenario also assumes that such vegetation will be consumed from the same sites for 90 consecutive days. These assumptions make the scenario quite unlikely.
- These HQs deal with individuals, not wildlife populations. Although an individual may be affected there won't be significant effects to the population.

Wildlife G03 sheet, the exposure HQ for aquatic plants, algae and fish had typical values greater than 1.0. from an accidental spill. This is not of significant concern because:

- With the provision of riparian buffer strips on streams, the risk of herbicide spills or movement into streams is further reduced.
- Mixing and dilution in active streams will minimize any potential hazard from any small spills which might occur during implementation of this project.

Hazard quotients for exposure of sensitive and tolerant terrestrial plants from runoff of triclopyr ester have hazard quotients greater than 1.0 for areas which receive more than 20 inches of annual rainfall. These values vary depending on the average annual rainfall in a given area and the scenarios assume that rain falls every 10 days. However, all proposed herbicide applications are to be applied directly to the targeted vegetation; therefore by correctly following application procedures, impacts to non-targeted species would be minimal. This will further protect non-targeted vegetation, including rare plants, from any direct or indirect impacts. Although some loss of terrestrial plants could possibly occur, there are mitigation measures already in place to protect sensitive species so overall effects should be minimal.

Imazapyr, foliar treatment @ 0.1 lbs/acre

This will be applied in a mix containing 3oz triclopyr ester and 0.5 oz imazapyr and is applied lightly over the top to just speckle the vegetation. This mixture uses less active

ingredient per acre than a formulation containing only triclopyr. The analysis was run at an estimated maximum application rate. Typical applications would use less than 1.4 lbs/acre.

Wildlife G03 sheet, hazard quotients to aquatic plants and algae had typical exposures greater than 1.0 for accidental spills. While imazapyr does have the potential to reach aquatic areas through runoff, such actual exposure and risk are mostly unlikely. Directed foliar sprays using imazapyr should be done in July or August when material washed off leaves tends not to be picked up by roots of non-target plants, allowing good selectivity. Imazapyr appears to bind loosely to clay particles and organic matter. It has relatively low soil mobility; soil activity expresses itself during the period of spring leaf expansion but applications made from late June through mid September produce little or no evidence of soil activity. With the provision of riparian buffer strips on stream zones, the risk of herbicide spills or movement into stream zones is further reduced. Perennial, intermittent, and ephemeral streams would be protected by 100, 100 & 25-foot buffers respectively, within which no imazapyr would be applied. Imazapyr might be able to move through the buffer, but are subject to dilution and mixing in transit. In addition, no imazapyr will be applied within 100 horizontal feet of lakes, wetlands, or perennial or intermittent streams or within 100 horizontal feet of any public or domestic water source. Exclusion zones will be clearly marked before herbicide application so applicators can easily see and avoid them.

Hazard quotients for exposure of sensitive terrestrial plants from runoff for imazapyr are greater than 1.0 for areas that receive more than 15 inches of rainfall per year. These values vary depending on the average annual rainfall in a given area and the scenarios assume that rain falls every 10 days. However, all proposed herbicide applications are to be applied directly to the targeted vegetation; therefore by correctly following application procedures, impacts to non-targeted species would be minimal. In addition, Imazapyr, the only herbicide proposed that has some degree of soil activity (only in the spring), will be applied only from late June to mid September when the chemical has little or no evidence of soil mobility. This will further protect non-targeted vegetation, including rare plants, from any direct or indirect impacts. Although some loss of terrestrial plants could possibly occur, there are mitigation measures already in place to protect PETS species so overall effects should be minimal.

APPENDIX C. PESTICIDE EMERGENCY SPILL PLAN

Field personnel transporting or working with pesticides should familiarize themselves with this plan, as well as with the labels and MSDSs of all pesticides to be used in a project. A copy of this plan is to be carried to the field by all crews working with pesticides; a copy is also to be kept in an easily accessible location near the telephone at the district dispatch or reception desk.

Emergency procedures to follow when a pesticide spill occurs at the work site:

1. PROVIDE FOR CARE OF INJURED OR CONTAMINATED PERSONNEL

Immediately determine if any personnel are injured or contaminated. Each situation may differ, but the major and immediate effort should be to assist injured personnel and minimize further contamination. Accordingly, the following must be accomplished as rapidly as possible.

- A. If a fumigant or dangerous vapor is involved, put on the appropriate respirator or breathing device. **REMEMBER**, this is an emergency procedure, and not intended for prolonged exposure. Since many pesticides can produce toxic fumes or vapors, always ventilate enclosed areas to prevent build-up of toxic fumes.
- B. Remove injured or contaminated personnel from the spill site to a safe area.
- C. If eyes are contaminated with a pesticide, give first priority to washing them out, using portable eyewash bottles, or if these are unavailable, any clean water. Remove contaminated clothing from affected individuals, and wash pesticides off skin with detergent and clean water. If any pesticides have been ingested, see Material Safety Data Sheet for specific first aid measures.
- D. Immediately seek medical assistance for injured and contaminated personnel. Do not leave contaminated individuals alone unless essential to secure aid. If necessary, direct a third person to stay with the injured until a physician takes charge and has been advised of the actual or possible pesticide exposure.
- E. Watch for the following symptoms of pesticide poisoning: Eye irritation, skin irritation, gastrointestinal discomfort, dizziness, headache, nausea, vomiting, diarrhea, slurred speech, muscle twitching or convulsions, or difficulty in breathing.

2. SPILL IDENTIFICATION

Determine product name(s) for the chemical(s) spilled and check the label and Material Safety Data Sheet for immediate hazards. Shut off ignition sources and stop any smoking in case chemicals may be flammable. Isolate contaminated area and keep unnecessary people away.

3. NOTIFY (Field personnel contact dispatcher/receptionist for aid)

District Pesticide Specialist: Sheldon Henderson
Office – 706-745-6928 ext 105
Cell – 706-781-5255
Home - 706-745-6746

District Safety Officer: Teresa Brown
Office – 706-745-6928 ext. 114
Cell - 706-781-5256
Home - 706-745-2953

Give the following information: *****Chemical name, ***location of spill, ***compartment number and ***stand number (if known), ***road name, and ***estimated size of spill in gallons.**

The District Pesticide Specialist will notify other key personnel and agencies as required (see attached notification list).

4. CONTAIN SPILL

Spilled pesticides must be contained as much as possible on the site where the spill has occurred. Keep spilled pesticides from entering streams, storm drains, wells, ditches, or water systems by following these procedures:

- A. Wear appropriate protective clothing. At a minimum, this will include suitable clothing for pesticide application, plus rubber or nitrile gloves and safety glasses or goggles. In addition, use coveralls or a rain suit, rubber boots or overshoes, or a respirator if extra protection is needed.
- B. Prevent further leakage from containers by repositioning them so that the damaged part of the container is above the level of the contents, or by applying rags, tape, or other materials at hand to temporarily seal the leak.
- C. Separate leaking containers from undamaged containers.
- D. Rope or flag off the area and post warning signs to keep unprotected personnel from entering.

- E. Confine the spill to prevent it from spreading. Encircle the spill area with a dike of sand or other absorbent material; rags or similar material may be used if necessary. If spilled material may flow toward sensitive areas, divert it by ditching.
- F. If the spill involves a small watercourse, dam it up to confine the spill if possible. If available, activated charcoal may be used to filter contaminated water. For larger waterways, a log boom or baled straw may be used to contain the spill. Dam or divert the flow of clean water around the spill if possible. Some pesticides (such as Glyphosate and Diquat) may be inactivated by muddying the water.
- G. If the pesticide spilled is a liquid, cover it with absorbent material (kitty litter is ideal). If the spilled pesticide is in a dry formulation, cover it with a secured plastic tarpaulin to prevent it from becoming wet or being blown away. (NOTE: Unless this material can be reused in accordance with the pesticide label, it must be disposed of as a toxic waste.)
- H. DO NOT flush the spill into a ditch, sewer, drain, or off a road, since this will further spread the chemical necessitating a larger cleanup effort.

Vehicle spill kits contain necessary items for containing small spills (see attached list for items needed in vehicle spill kit). Large spills may require the use of a dozer and/or additional items from the storage facility spill kit, located at the Brasstown Work Center.

5. CLEAN-UP

Spill containment is the objective of this emergency spill plan. Clean-up and disposal procedures are covered in FSH 2109.14, Chapter 33, Project Safety Plan; in the 1993 Emergency Response Guidebook ("Orange Book"), and in the Material Safety Data Sheets for each pesticide.

6. DOCUMENTATION

Document spill type, action taken, and any needed follow-up or assistance necessary in a letter to the Forest Supervisor, with cc to Regional Pesticide Specialist.

SUMMARY OF CLEAN-UP STEPS

DRY SPILLS

- a. Immediately cover powders or dusts with plastic or a tarpaulin to prevent the pesticide from becoming airborne. A fine mist of water may also be used to

dampen the dust and reduce spreading. CAUTION: Too much water may dissolve the pesticide and move it into the soil.

- b. Sweep the material together, rolling the tarp back slowly as you do.
- c. Shovel the material into plastic bags or drums.
- d. Seal the bags and label them, identifying the pesticide and other contents.
- e. Store the containers of material in the pesticide storage building until the contents can be evaluated for disposal or re-use in a manner consistent with labeling.

LIQUID SPILLS

Pump or bail as much of the spilled liquid as possible into containers, then:

- a. Use absorbent material, such as commercially bagged clay, kitty litter, or sawdust to soak up the spill. Use only enough material to absorb the spill. Begin spreading the absorbent material around the edge of the spill, and work toward the center.
- b. Shovel the absorbent material and pesticide, along with any contaminated soil, into leak-proof containers.
- c. Label all containers.
- d. Store the containers in the pesticide storage building until the contents can be evaluated for disposal or re-use in a manner consistent with labeling.

NOTIFICATION LIST OF KEY PERSONNEL AND AGENCIES

1. District Pesticide Specialist: Sheldon Henderson
Office – 706-745-6928 ext 105
Cell – 706-781-5255
Home - 706-745-6746
2. District Safety Officer: Teresa Brown
Office – 706-745-6928 ext. 114
Cell - 706-781-5256
Home - 706-745-2953
3. Union County Hospital 706-745-2111
4. Union County Fire Department 911
5. Union County Sheriff 706-439-6066
6. Forest Pesticide Specialist – Ron Stephens
Home 770-983-0728
Office 770-297-3020
(Notify if spill is larger than 5 gallons)
7. State office of emergency services – GEPD Emergency Response
(800) 241-4113
(404) 656-4300
<http://www.dnr.state.ga.us/dnr/environ/>
(Notify only if assistance is necessary or if required by state law)
8. USFS Region 8 Spill Coordinator – Walt Sternke
Office – 404-347-3369
wsternke@fs.fed.us
9. Pesticide manufacturers

Riverdale (Tricopyr and Glyphosate) 1-800-424-9300 (Chemtrec)
BASF (Imazapyr) 1-800-832-HELP
10. CHEMTREC - EPA number for technical assistance - 1-800-424-9300
11. EPA National Emergency Response Center - 1-800-424-9346
(Notify only if spilled chemical is on CERCLA Consolidated Chemical List)
12. Pesticide Safety Team of the National Agricultural Chemicals Association (for technical assistance) - 1-513-961-4300

13. Local sources of emergency equipment and supplies

Nelson's ACE Hardware 706-745-6380

Owltown Feed & Supply 706-745-4525

Patton Grading 706-745-7697

Georgia Forestry Commission 706-781-2398

RECOMMENDED PESTICIDE SPILL KIT CONTENTS

Storage Facility Kit

4 pairs nitrile gloves

2 pairs unvented goggles

2 respirators and cartridges (chemical resistant)

2 pairs rubber or neoprene boots or overshoes

2 pairs of coveralls or rain suits

1 roll of flagging or engineers' tape

1 dust pan

1 shop brush

1 dozen polyethylene bags with ties

1 gallon liquid detergent

1 polyethylene or plastic tarp

100 feet of rope

10 blank labels

1 ABC-type fire extinguisher

80 lbs absorbent material

3 gallons household bleach

1 square-point "D" handled shovel

1 55-gallon open-head drum, or 50-gallon plastic trash can with lid

1 18-inch push broom with synthetic fibers

1 bung and 1 bung wrench for 2.5 inch and 0.75 inch bungs

1 drum spigot

30 ft. of .5 inch polyethylene tubing or 150 feet of garden hose

Vehicle Kit

2 pairs nitrile gloves

1 pair unvented goggles

1 respirator and cartridges

1 pair of rubber or neoprene boots

1 dust pan

1 shop brush

6 polyethylene bags with ties

1 pint liquid detergent

1 polyethylene or plastic tarp

10 blank labels

1 ABC-type fire extinguisher

10-30 lbs. absorbent material

2 eyewash bottles

1 round-point shovel

1 portable weatherproof container for storage and transport (may also be used for cleanup)

APPENDIX D. AGENCIES AND INDIVIDUALS PROVIDING CONSULTATION

Glen Boland, Lake Nottely Improvement Association

A.G. Sherman, Lake Nottely Improvement Association

Katherine Groves, Georgia Forest Watch, Ecologist

Debbie Royston, Georgia Forest Watch, Director

Lamar Paris, Union County, Commissioner

Jimmy Smith, Georgia Forestry Commission

Jay Cantrell, Georgia Department of Natural Resources, Wildlife Biologist

Kent Kammermeyer, Georgia Department of Natural Resources, Wildlife Biologist

Nathan Klaus, Georgia Department of Natural Resources, Wildlife Biologist

Reggie Weaver, Georgia Department of Natural Resources, Fisheries Biologist

Cindy Wentworth, Chattahoochee-Oconee National Forests, Botanist/Ecologist

Sandy Henning, Chattahoochee-Oconee National Forests, Sales Forester

Ron Stephens, Chattahoochee-Oconee National Forests, Silviculturist

Ray Ellis, Chattahoochee-Oconee National Forests, Natural Resources Staff Officer

John Petrick, Chattahoochee-Oconee National Forests, Planner

APPENDIX E. PERSONS, AGENCIES, AND ORGANIZATIONS PROVIDING PUBLIC INPUT

Dennis Stansell – Georgia Forest Watch

Dr. James Earl Kennamer, National Wild Turkey Federation

Jeffrey P. Durniak – Georgia Department of Natural Resources

Zasha Bassett – Sierra Club, Georgia Chapter Wildlands Committee

APPENDIX F. PERSONS AND ORGANIZATIONS NOTIFIED OF THE PROPOSED ACTION

On June 24, 2004 82 entities were mailed a scoping letter detailing the proposed actions of the Davenport Mountain Project. The mailing list for the scoping letter is in the project file.

APPENDIX G. LIST OF PREPARERS

Name	Title
Becky Bruce	Archeologist
Sheldon Henderson	Forester
Carolyn Hoffman	Landscape Architect
David Kuykendall	Outdoor Recreation Planner
Emily Loomis	Recreation Specialist Trainee
Peter Myers	Fire Management Officer
Dick Rightmyer	Soil Scientist
Jim Wentworth	Wildlife Biologist
Mary Yonce	Forester Trainee

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