

ENVIRONMENTAL ASSESSMENT

**Etowah River Watershed Project
Chattahoochee National Forest
Blue Ridge Ranger District
Lumpkin County, Georgia**

August 2007

Responsible Agency:
U.S.D.A. Forest Service

Responsible Official:
**Alan Polk
Blue Ridge District Ranger**

For further information contact:
**Rachelle Powell, Wildlife Biologist Trainee
Blue Ridge Ranger District
P. O. Box 9
Blairsville, GA 30514
(706) 745-6928 ext. 121
rachellepowell@fs.fed.us**

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Chapter 1

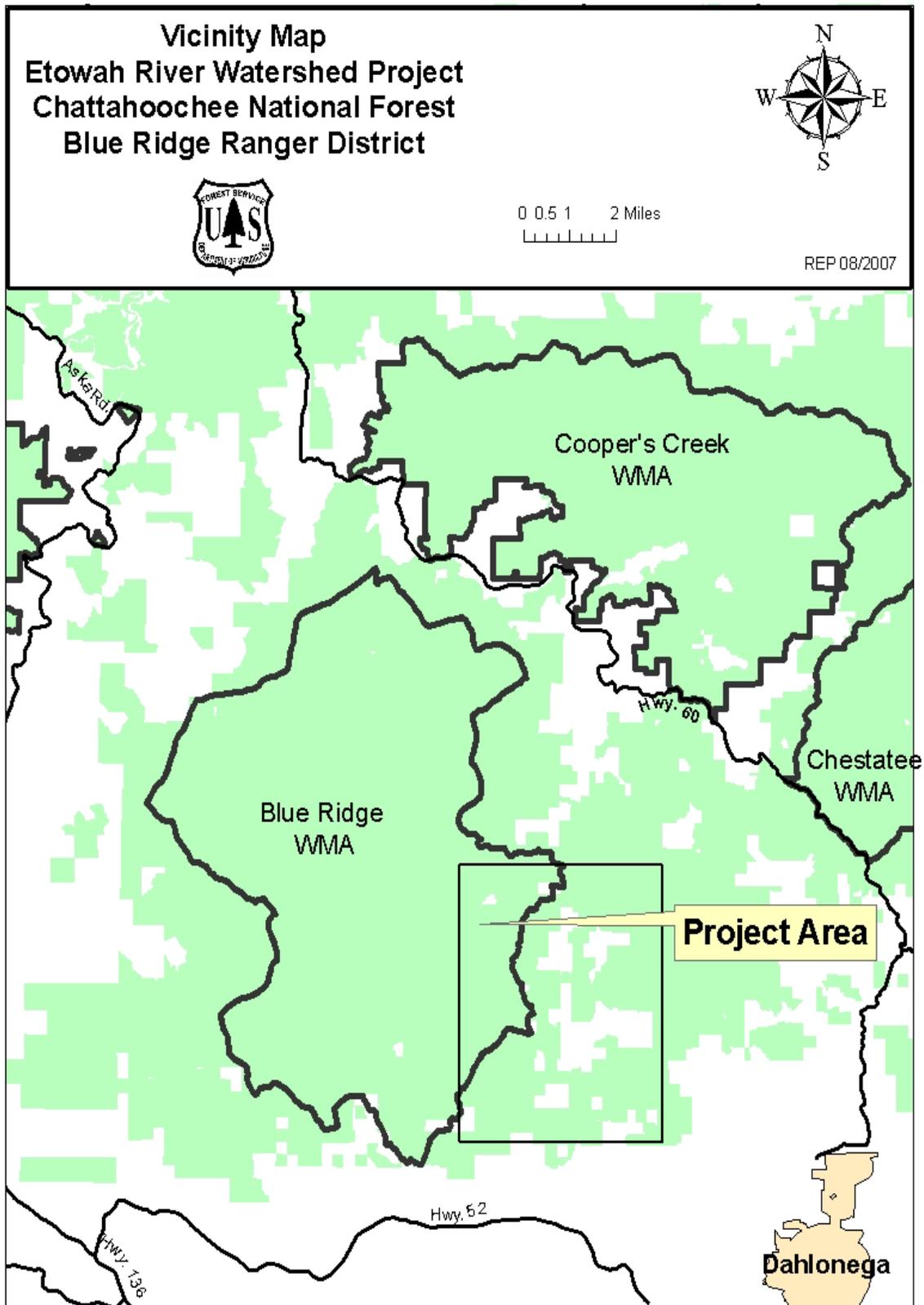
Introduction

1.1 Background

The Etowah River Watershed begins north of Dahlonega in Lumpkin County, Ga. The Etowah River joins the Oostanaula River to create the Coosa River, which flows west into Alabama. The Etowah River Watershed project is located in the upper headwaters of the Etowah River near Camp Frank D. Merrill (Figure 1). A portion of the project area is in the Blue Ridge Wildlife Management Area (WMA).

The Forest Service purchased most of the property in the area during the late 1920's and early 1930's. Some additional tracts were acquired in the late 1960's. At that time of purchase the land was a mix of abandoned fields, cutover timberland and forests of white pine and mixed oak/southern yellow pine. For many years, the area was actively managed for timber production. In addition, a number of stands were salvaged following natural disasters such as blizzards and Southern Pine Beetle (SPB) outbreaks. Many of the harvested stands were planted back to loblolly or white pine. As a result, there now are a significant number of 20-30 year old plantations in the project area. More recently SPB has affected some of these stands, creating open areas. Most of these areas are regenerating to white pine and/or red maple along with limited oak and yellow pine seedlings.

Figure 1: Vicinity Map



1.2 Overview of Proposed Action

The Blue Ridge Ranger District of the Chattahoochee National Forest is proposing a vegetation management project located within the Etowah River watershed. This proposal addresses (A) ecosystem restoration, (B) forest health, (C) early successional forest habitat creation, (D) access/road management, (E) soil and water improvement and, (F) stream habitat enhancement.

The majority of the project area is located within the Forest Plan Management prescription 9.H, Management, Maintenance, and Restoration of Plant Associations. Prescription 9.H has the purpose of restoring historical plant associations and their ecological dynamics on appropriate sites ecologically (Plan 3-167). A small portion of the project area is located within 9.A.1, Source Water Protection Watersheds and 9.F, Rare Communities. Prescription 9.A.1 has the purpose of maintaining healthy watersheds that provide municipal water for treatment and use (Plan 3-149). Prescription 9.F has the purpose of maintaining community diversity through restoration and maintenance of rare communities (Plan 3-157). All riparian corridors fall under prescription 11, Riparian Corridors. Prescription 11 has the purpose of managing riparian corridors such that ecological processes and functions are retained, enhanced and/or restored (Plan 3-171).

1.3 Need for the Proposed Action

The purpose and need for this project is to move the area towards the desired condition in the Forest Plan by restoring communities in decline and restoring communities to historic composition that were converted by land uses. This will be accomplished by restoring approximately 108 acres of table mountain pine, approximately 119 acres of oak/oak-pine, and approximately 2 acres of canebrake.*

In addition, the project will also address other Forest Plan goals and objectives (Table 1). Along with the restoration of declining and historic communities, the project will provide for forest health through first time thinnings on approximately 405 acres of pine plantations; enhance wildlife habitat through the creation of approximately 83 acres of early successional forest habitat; improve water quality conditions through road maintenance activities along three system roads and the closing of one eroding road; and enhance stream habitat conditions for trout and other aquatic species through the maintenance of existing and construction of new improvement structures.

* Maps and acreages for the project area have been created utilizing geospatial information prepared by the U.S. Department of Agriculture, Forest Service. Geographic information system (GIS) data and product accuracy may vary. They may be: developed from sources of differing accuracy, accurate only at certain scales, based on modeling or interpretation, incomplete while being created or revised, etc. Using GIS products for purposes other than those for which they were created may yield inaccurate or misleading results.

Existing and Desired Conditions

Table Mountain Pine Restoration

Table mountain pine (*Pinus pungens*) is an endemic species to the Appalachian chain, occupying xeric or dry sites and is often associated with pitch pine (*P. rigida*). The 3 stands proposed for treatment are mid-successional shortleaf pine/oak and mixed oak/yellow pine stands. All three have a small percentage of mature table mountain pine but lack any table mountain pine regeneration. The Forest Plan states that management activities should be developed to maintain rare communities (Objective 9.F-03, Plan 3-164). Restoration means getting back TMP as the ‘plurality’ of the pine stocking in the short (3 to 5 year) term. This will be accomplished using a regeneration cut that will reduce the overstory and midstory and then prescribed burning the area to provide a seedbed for TMP regeneration (Objective 9.F-04, LRMP 3-164). The proposed action includes all of these management activities.

Oak/Oak-pine Restoration

Two stands are being proposed for restoration of oak/oak-pine forest communities. Although this community is not rare, in some areas it has been replaced with pine plantations. The two stands proposed for restoration have been altered by previous management activities. Compartment 566, stand 19, is dominated by Virginia Pine. The neighboring stand 21 is a shortleaf pine-oak stand that contains some white pine and some Virginia pine that has moved in from stand 19. Both stands have several southern pine beetle killed spots that have opened up the area for advanced oak and shortleaf pine regeneration. The restoration of oak/oak-pine forests on sites currently occupied by pine plantations is outlined in Objective 3.6 in the Forest Plan ((Plan 2-6). The proposed activities include removing mature planted Virginia pine and younger naturally seeded Virginia and white pine in the two stands, further releasing the oak and shortleaf regeneration, which has already occurred in some southern pine beetle created openings. These activities are an incremental step designed to shift the composition away from pine-oak to oak/oak-pine.

Canebrake Restoration

The restoration area for river cane is located in compartment 586, stand 1, where there is an existing canebrake along the Etowah River. Expansion of the current canebrake has been stifled by white pines that were planted along the riverbank in approximately 1982. The Forest Plan provided direction that management activities will be designed to “increase the vigor, density, and area of existing patches of cane” ((Plan 3-165). The restoration activities would include either girdling existing white pines or cutting them in place to encourage river cane to continue and speed up its advance across the floodplain, into the area occupied by white pines, in the medium term (5-10 years) by providing a higher light intensity, resulting in higher photosynthetic rates and faster growth in the cane.

Forest Health

The southern pine beetle (SPB) poses a persistent threat to all of the southern pine species. Maintaining a healthy and growing stand is the best way to prevent attacks.

There are nine stands being proposed for thinning that have an average age of 19-33 years and currently have basal areas ranging from 110 to 150 square feet per acre. This is approximately twice as many stems as they should have for optimum SPB resistance. The Forest Plan states that stands of species at highest risk for SPB should be maintained at a level of no more than “fully stocked” (Objective 40.1, Plan 2-39), and all of these stands far exceed that level. The proposed action includes the first-time commercial thin of 405 acres in nine different stands that contain a heavy pine component or are overstocked pine plantations in order to maintain stand vigor.

Early Successional Forest Habitat

Age class diversity in the Etowah River Watershed is very much slanted toward older age classes, where over half of forest communities are over 80 years old. Early successional forest habitat (ESFH) is defined as regenerating forest stands dominated by forbs and shrubs with a stand age of 0 to 10 years. Currently there are no stands in the watershed less than 10 years of age. Goal 2 of the Forest Plan describes a diversity of habitat with ESFH “well distributed in all forest types, elevations, aspects, and slopes...” (Plan B-20). The proposed action includes the creation of 34 acres of ESFH around thirteen existing permanent wildlife openings and 49 acres along roads in the project area.

Access/Road Management

Preventing sediment from permanent forest roads from reaching a stream channel is important in every watershed. To do this, roads must be maintained with adequate water drainage structures. The proposed action includes 3 permanent Forest Service roads that would receive water drainage improvement: FS880 (Two Run Creek), FS141 (Montgomery Creek) and FS98 (Dunn Branch). These roads have existing culverts and/or drainage structures to reduce soil erosion that need to be replaced and/or reshaped to improve or restore their effectiveness. Goal 48 of the Plan states that roads should not “adversely affect soil and water resources” (Plan 2-44). These three roads would receive culvert replacement and/or broad based dips and wing ditch reshaping.

Soil and Water Improvement

The forest service has recently acquired a property near Pierce Cemetery on the Hightower Church Road. There is an unnamed, eroding road on this property, just west of Pierce Cemetery, that has the potential to impact soil and/or water quality. Forest Plan Goal 24 requires that soil productivity and quality be maintained or restored (Plan 2-20). This road, which is approximately 500 feet, will be blocked from vehicle passage with either natural barriers or a gate, revegetated and have suitable water diversion structures like water bars, check dams or broad-based dips installed.

Stream Habitat Enhancement

The proposed action includes the enhancement of stream habitat conditions for trout and other aquatic species in Montgomery Creek and the Etowah River. The stream segments proposed for work are low gradient, with limited cover and pool habitat. The Plan states that aquatic habitats should be maintained and/or restored such that they are “capable of supporting viable populations of native and desired nonnative species...” (Goal 26, Plan 2-21). The work would improve habitat conditions by deepening pools, constricting the

channel to flush sediments, providing cover, and stabilizing stream banks to prevent further erosion. This would involve the maintenance of existing improvement structures in Montgomery Creek as well as the construction of new stream improvement structures in both Montgomery Creek and the Etowah River.

Table 1: Proposed Actions and Associated Plan Objectives.

Summary Table Of Proposed Action and Associated Land Management Plan Objective			
Project	Goal/ Objective	Paraphrased Language	Acres
Restore Table Mt. Pine Communities	OBJ-9.F-03	Restore table mountain pine forests on the Chattahoochee, reestablish these forest types on sites where they once likely occurred...(Plan 3-164).	108
Restore Oak - Oak Pine Communities	OBJ 3.6	Restore oak or oak-pine forests...on appropriate sites currently occupied by pine plantation of other hardwood species such as gum and maple (Plan 2-6).	119
Restore Canebrakes	OBJ-9.F-05	Restore 200 acres of canebrake communities over the first ten years of plan implementation (Plan 3-165).	2
Southern Pine Beetle Prevention	OBJ 40.1	Maintain forest-stocking levels at no more than 'fully stocked' for the species, age and site quality with priority for treatment given to those vegetation communities at highest risk of insect or disease attack (Plan 2-39).	433
Early Successional Forest Habitat	GOAL 2	Early successional habitat will be well distributed in all forest types, elevations, aspects, and slopes including riparian corridors (Plan 2-4).	84
Access/Road Maintenance	GOAL 48	Roads do not adversely affect soil and water resources (Plan 2-44).	8 mi.
Soil and Water Improvement	GOAL 24	Maintain or restore soil productivity and quality (Plan 2-20)	1 mi.
Stream Habitat Improvement	GOAL 26	Restore and/or maintain aquatic ecosystems...capable of supporting viable populations of all native and desired nonnative species of aquatic flora and fauna within the planning area (Plan 2-21).	0.5 mi.

1.4 Details of the Proposed Action

A. Ecosystem Restoration

Table Mountain Pine Restoration

In order to promote restoration of this locally unique species, the treated stands would be allowed to become self-sustaining through seedbed preparation and removal of dense mid and understory, including mountain laurel. The proposed actions include a 108 acre modified seedtree cut, the modification being that species other than TMP will be retained even though their seed isn't desired, in compartment 571, stands 27, 29, and 31 from a current basal area of 130 square feet per acre down to an average of 40 square feet per acre, leaving about 30 trees per acre. All three stands contain scattered older residual

table mountain pine. Along with table mountain pine, species that shall be left include pitch pine, shortleaf pine and oaks. Following the modified seedtree cut, the area may be prescribed burned to prepare a seedbed for regeneration of table mountain pine. The burning block would be approximately 240 acres. Effectiveness of the treatments will be evaluated by the quantity of table mountain pine regeneration 2-3 years after treatments have been carried out. Timber harvesting would occur within five years of the decision and burning would be carried out the winter after timber harvest, prior to slash curing. Stand information and proposed treatments are listed in Table 2.

Table 2: Stands to be included in the restoration of table mountain pine community.

Ecosystem Restoration - Table Mountain Pine Community					
Comp/Stand	Acres	Stand Condition	Forest Type	Treatment	Age Year
571027	43	Sparse Sawtimber	Shortleaf Pine/Oak	Seedtree Cut & Burn	1966
571029	16	Sparse Sawtimber	Shortleaf Pine/Oak	Seedtree Cut & Burn	1966
571031	49	Sparse Sawtimber	Mixed Oak/ Yellow Pine	Seedtree Cut & Burn	1966
571025	41	Immature Sawtimber	Bottomland Hwds/ Yellow Pine	Burn	1966
571028	27	Immature Poletimber	White, Red Oak/ Hickory	Burn	1974
571032	19	Immature Sawtimber	Upland Hwds/ White Pine	Burn	1966
571034	11	Immature Poletimber	White Pine	Burn	1983
571035	37	Immature Sawtimber	Upland Hwds/ White Pine	Burn	1966

Restore Oak/Oak-Pine Communities

The proposed action includes commercially thinning stands 19 and 21 in Compartment 566 (119 acres total). The proposed activities include removing merchantable, mature Virginia pine and younger Virginia and white pine in the two stands. Both stands currently have a basal area ranging from 120 square feet per acre to 170 square feet per acre and would be thinned to an average of 65 square feet of residual basal area. Healthy mast producing red and white oak species along with Shortleaf pine will be retained. Timber harvesting would occur within five years of the decision. The stand information and treatments are listed in Table 3.

Table 3: Stands to be included in the restoration of oak / oak-pine community.

Ecosystem Restoration Projects - Restoration Oak-Oak Pine					
Comp/Stand	Acres	Stand Condition	Forest Type	Treatment	Age Year
566019	91	Mature Sawtimber	Virginia pine	Thin and burn	1938
566021	28	Low Quality Sawtimber	Shortleaf pine/oak	Thin and burn	1909

Restore Rare Communities: Canebrakes

The proposed action includes restoring a corridor of canebrake along the Etowah River near the Hightower Bridge. This restoration area is contained within compartment 586, stand 1, where there is an existing area of river cane. Restoration activities would include either girdling existing white pines or cutting them in place. The white pines currently have a basal area around 120 square feet per acre. In order to temper any major shifts in shade regime along the riverbank, approximately 50 square feet of residual basal area would remain. Any cutting or girdling of the trees would be done within 5 years of the decision. The restored area will be approximately two acres.

B. Forest Health

Southern Pine Beetle Prevention

The stand ages for all nine stands range from 19-33 years. These stands currently have basal areas ranging from 110 to 150 square feet per acre. The stands would be thinned to a target density of about 60 square feet of residual basal area per acre, leaving about 70 trees per acre. In cases where hardwoods are present, they would not be cut. Timber harvesting would occur within five years of the decision. Stand types and other information can be found in Table 4.

Table 4: Stands to be included in the Southern Pine Beetle prevention project.

Forest Health Projects - Southern Pine Beetle Prevention					
Comp/Stand	Acres	Stand Cond	Forest Type	Treatment	Age Year
567001	38	Immature Poletimber	Shortleaf Pine	SPB thin	1988
567005	13	Immature Sawtimber	Shortleaf Pine	SPB thin	1988
567012	14	Immature Poletimber	Loblolly Pine	SPB thin	1988
571010	161	Immature Sawtimber	White Pine – Upland Hwd	SPB thin	1974
586004	50	Immature Sawtimber	Loblolly Pine	SPB thin	1980
586013	37	Immature Sawtimber	Loblolly Pine	SPB thin	1979
586017	34	Immature Sawtimber	Loblolly Pine	SPB thin	1978
586040	6	Immature Sawtimber	Loblolly Pine	SPB thin	1980
586042	52	Immature Sawtimber	Loblolly Pine	SPB thin	1980

C. Early Successional Forest Habitat Enhancement

1) Creation of Early Successional Forest Habitat – Existing Wildlife Openings

The proposed action includes the creation of 34 acres of early successional forest habitat around thirteen existing permanent wildlife openings, which vary in size from one-quarter acre to approximately three acres. Approximately half of the proposed wildlife opening activities would occur within the Blue Ridge Wildlife Management Area. Enhancement activities around the existing wildlife openings include thinning forest habitat that surrounds the existing openings for a distance of 100 feet, to an average of 30 square feet of basal area. Trees that remain would be mast producing hardwoods like oak species, hickories and black gum or yellow pine. Timber harvesting would occur within five years of the decision. Table 5 contains the numbers of openings to be treated and associated roads.

Table 5: Wildlife openings to be enhanced with early successional forest habitat.

Early Successional Forest Habitat Enhancement – Wildlife Openings		
Location	Number of Openings	Estimated Acres of Created Habitat
FS142	3	7
FS141	6	16
FS 28-1	2	4
FS 28B	2	7

2) Creation of Early Successional Forest Habitat – Road Daylighting

The daylighting project would occur on 1.6 miles of FS141, the Montgomery Creek Road, 1.4 miles of FS142, the Hightower Creek Road and 1.1 miles of FS28F, the Upper Nimblewill Road. Early successional forest habitat would be created by thinning mid and overstory vegetation to an average of 30 square feet of basal area for a distance of 50 feet from each side of the road edge. Trees that remain would be mast producing hardwoods like oak species, hickories, black gum or yellow pine. Timber harvesting would occur within five years of the decision. Refer to Table 6 for acreages of habitat that would be created for each section of road.

Table 6: Sections of road that will be enhanced with early successional forest habitat.

Early Successional Forest Habitat Enhancement – Road Daylighting		
Location	Length in Miles	Estimated Acres of Created Habitat
FS141	1.6	19
FS142	1.4	17
FS28F	1.1	13

D. Access/Road Management

The proposed activities within this project would require maintenance on 8 miles over several forest roads. The roads would have culverts replaced and other drainage structures such as broad based dips and wing ditches reshaped. Forest Service roads that would receive water drainage improvement include FS880 (Two Run Creek), FS141 (Montgomery Creek) and FS98 (Dunn Branch). This will be done within 5 years of the decision in conjunction with other activities in this proposal.

E. Soil and Water Improvement

The water quality improvement area would be on approximately 500 feet of an unnamed, eroding road located on the Hightower Church Road, just to the west of Pierce Cemetery. This road will be blocked from vehicle passage with either natural barriers or a gate, revegetated and have suitable water diversion structures like water bars, check dams or broad-based dips installed. This will be done within 5 years of the signed decision in conjunction with other activities in this proposal.

F. Stream Habitat Enhancement

The work would involve the maintenance of existing improvement structures in Montgomery Creek as well as the construction of new stream improvement structures in both Montgomery Creek and the Etowah River. The proposed stream habitat improvement work is designed to improve habitat conditions by deepening pools, constricting the channel to flush sediments, providing cover, and stabilizing stream banks to prevent further erosion. The logs used to construct the structures would be obtained from nearby trees. This will be done within 5 years of the decision in conjunction with other activities in this proposal.

1.5 Decision to be Made

The decision to be made is whether or not table mountain pine restoration, oak/oak-pine community restoration, canebrake restoration, thinning for forest health, early successional forest habitat creation, access/road management, soil and water improvement and stream habitat enhancement should be conducted using the proposed treatments or other types of treatments.

1.6 Scoping

A detailed letter about the projects was sent to 106 individuals, agencies, news organizations and public organizations. The proposal also appeared in the quarterly Schedule of Proposed Actions for the Chattahoochee-Oconee National Forests.

Responses to the scoping of the project were received from 11 individuals and groups and one agency.

1.6.1 Significant Issues

An Interdisciplinary Team (ID Team) was formed and included the following specialists:

Steve Cole (Co-ID Team Leader, Silviculture)
Rachelle Powell (Co-ID Team Leader, Wildlife Biology)
Jim Wentworth (Wildlife Biology/Fisheries)
Alison Koopman (Recreation/Trails)
Mike Davis (Fire/Fuels)
Dick Rightmyer (Soil Science/Roads)
Becky Bruce (Cultural Resources)
Jake Cowart (Special Uses/Lands)
Kate Metzger (Hydrology)
Ron Stephens (Silviculture)
Cindy Wentworth (Botany/Rare Species).

The ID Team reviewed public and internal comments and developed a list of issues that might apply to the proposed action. The issues were sorted into those that were significant and other issues. They were then grouped by a common cause or effect. Non-significant issues are in the project file. The deciding official, the District Ranger, approved the following four significant issues:

Significant Issue 1: The Oak/Oak-Pine restoration areas in compartment 566, stands 19 & 21 will need further maintenance through use of herbicide, fire or mechanical equipment to keep out Virginia Pine and White Pine seedlings to maintain an Oak/Oak-Pine forest type. The measure that will be used to track this issue will be the acres of treatments (i.e. burning, mechanized removal of competition) needed to maintain the oak/oak-pine composition.

Significant Issue 2: The Table Mountain Pine restoration areas will not promote Table Mountain Pine without further maintenance through use of herbicide, fire or mechanical equipment. The measure that will be used to track this issue will be the acres of treatments (i.e. burning, mechanized removal of competition) needed to maintain Table Mountain Pine.

Significant Issue 3: Thinning across Two Run Creek in compartment 566, stand 19 may cause increased sedimentation into Two Run Creek. The measure that will be used to track this issue will be acres of soil disturbance in riparian corridors in compartment 566, stand 19.

Significant Issue 4: Working in the southwest portion of Compartment 566, stands 19 & 21 may cause increased sedimentation in Two Run Creek. The measure that will be used to track this issue will be acres of soil disturbance in riparian corridors in compartment 566, stand 19 & 21.

Chapter 2

Alternatives

2.0 Alternatives including the Proposed Action

2.1.1 No action (Alternative 1)

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 8). This alternative would respond to significant issues 3 & 4 by not doing the actions that prompted the issues (Table 9).

2.1.2 Proposed Action (Alternative 2)

Refer to “1.4 Details of the Proposed Action” for a complete description of the initial proposal.

2.1.3 Alternative 3

Alternative 3 would include all of the activities in Alternative 2 with these modifications:

(1) In the Table Mountain Pine restoration area (compartment 571 stands 31,29 & 27) a combination of both mechanized equipment (chainsaws) and multiple prescribed burns will be used as needed to control competition and promote Table Mountain Pine. As in the proposed action, the burn block would also include portions of stands 35, 34 & 32 in compartment 571.

(2) In the Oak Oak/Pine restoration area (compartment 566 stands 19 and 21), the portion of stand 19 on the southeast side of Two Run Creek Road (FS 880) and the southwest portion of stands 19 & 21 will not be thinned to reduce the possibility of increased sedimentation in Two Run Creek. As a result, acres of thinning will be reduced to 54 acres. Both mechanized equipment (chainsaws) and multiple prescribed burns will be used as needed to promote Shortleaf Pine and control competition from Virginia and white pine. The burn block would also include stands 1 & 13 in compartment 566 and would total approximately 87 acres (Table 7). Refer to Figure 3.

Table 7: Stands and Acres to be treated in Oak/Oak-pine Restoration under Alternative 3.

Comp/Stand	Acres	Stand Cond	Forest Type	Treatment	Age Year
566019	28	Mature Sawtimber	Virginia pine	Thin and burn	1938
566021	26	Low Quality Sawtimber	Shortleaf pine/oak	Thin and burn	1909
566013	12	Low Quality Poletimber	Shortleaf pine	Burn	1985
566001	21	Low Quality Sawtimber	Shortleaf pine/oak	Burn	1909

(3) Georgia DNR will be allowed to use mechanized equipment to maintain the early-successional forest habitat created by this project as they have the funds and time available. Refer to Figure 2.

This alternative responds to all of the significant issues (Table 9).

2.1.4 Alternative 4

This alternative would include all of the activities listed in Alternative 3 above except that only mechanized equipment (chainsaws) will be used to control competition in the Table Mountain Pine restoration area (Compartment 571 stands 27, 29 & 31) and Oak-Oak-pine restoration area (Compartment 566 stands 19 & 21). Chainsaws would be used to remove white pine and Virginia pine saplings up to 5" DBH every 4-10 years. No prescribed burning would be utilized. Refer to Figure 4.

This alternative responds to all the significant issues (Table 9).

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 on pages 17 & 18.

2.2 Alternatives Considered, But Not Evaluated In Detail

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 to implement all of Alternative 3 with the exception of stands 19 & 21 on Two Run Creek Road in compartment 566, which would be dropped from treatment all together. The ID team explored this alternative at one of their meetings and decided that issues related to these 2 stands were address sufficiently by the boundary modifications in Alternative 3 and an additional alternative was not necessary. For these reasons this alternative was dropped from further study.

Figure 2: Map of Proposed Action

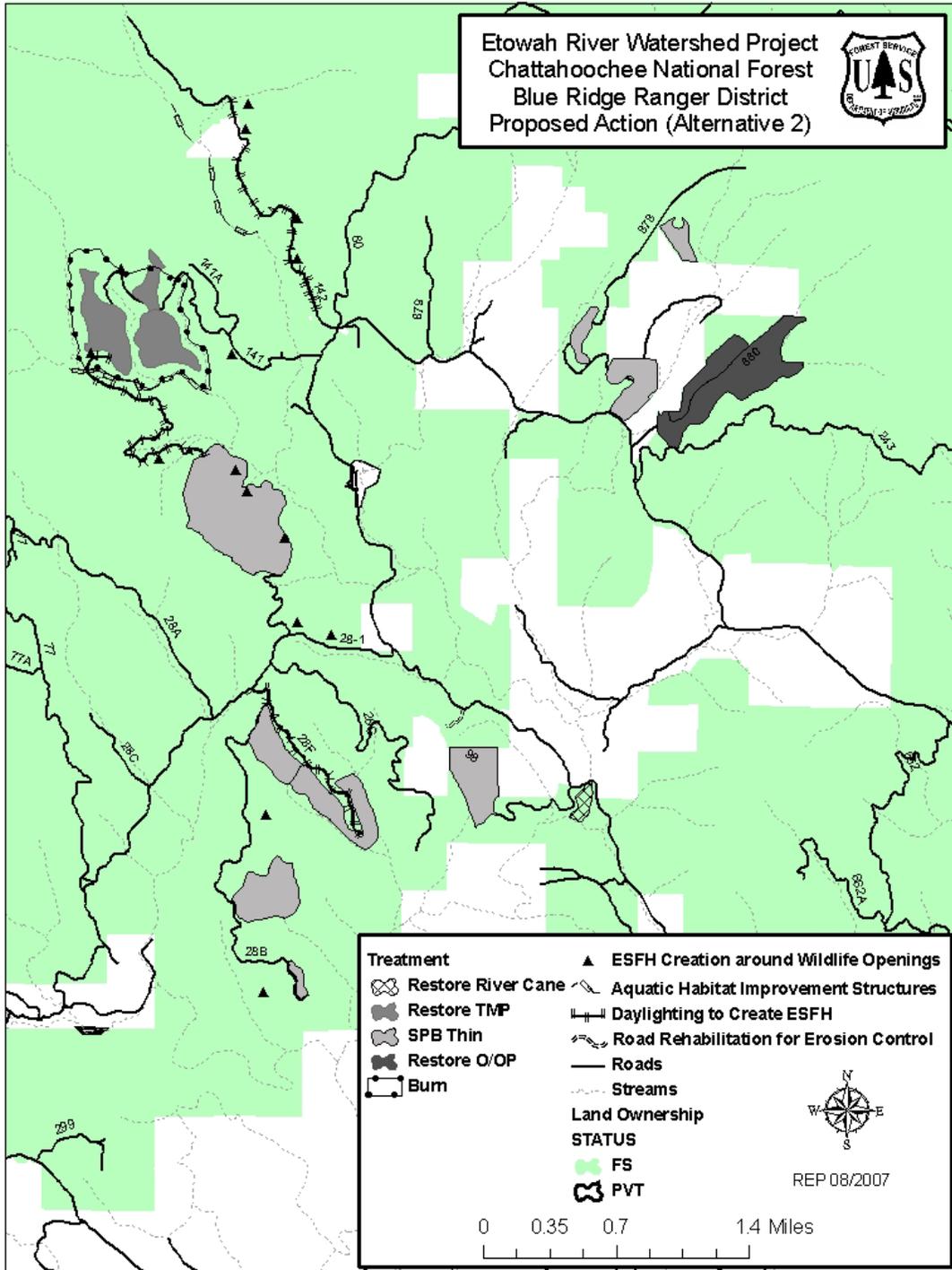


Figure 3: Map of Alternative 3.

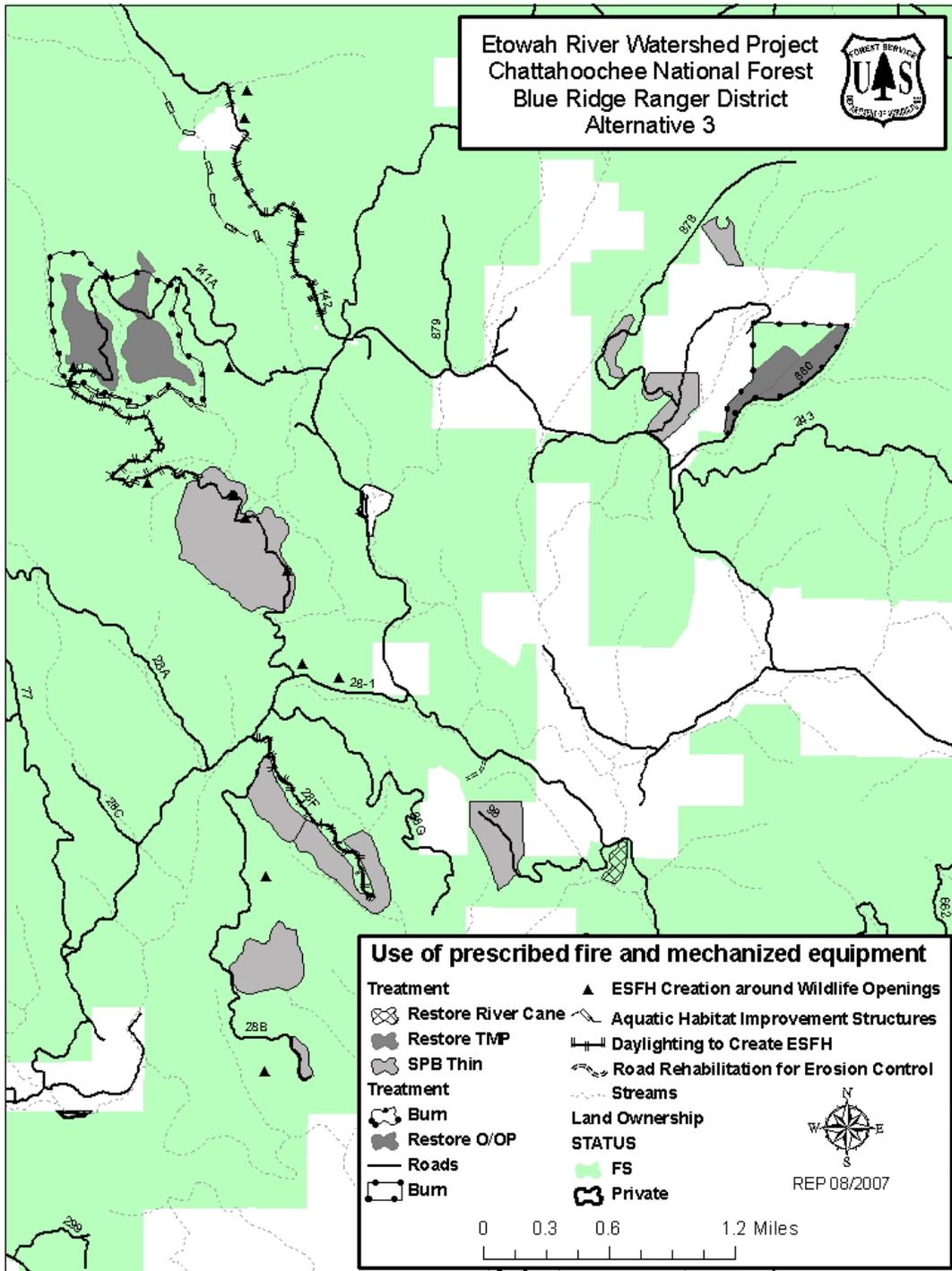
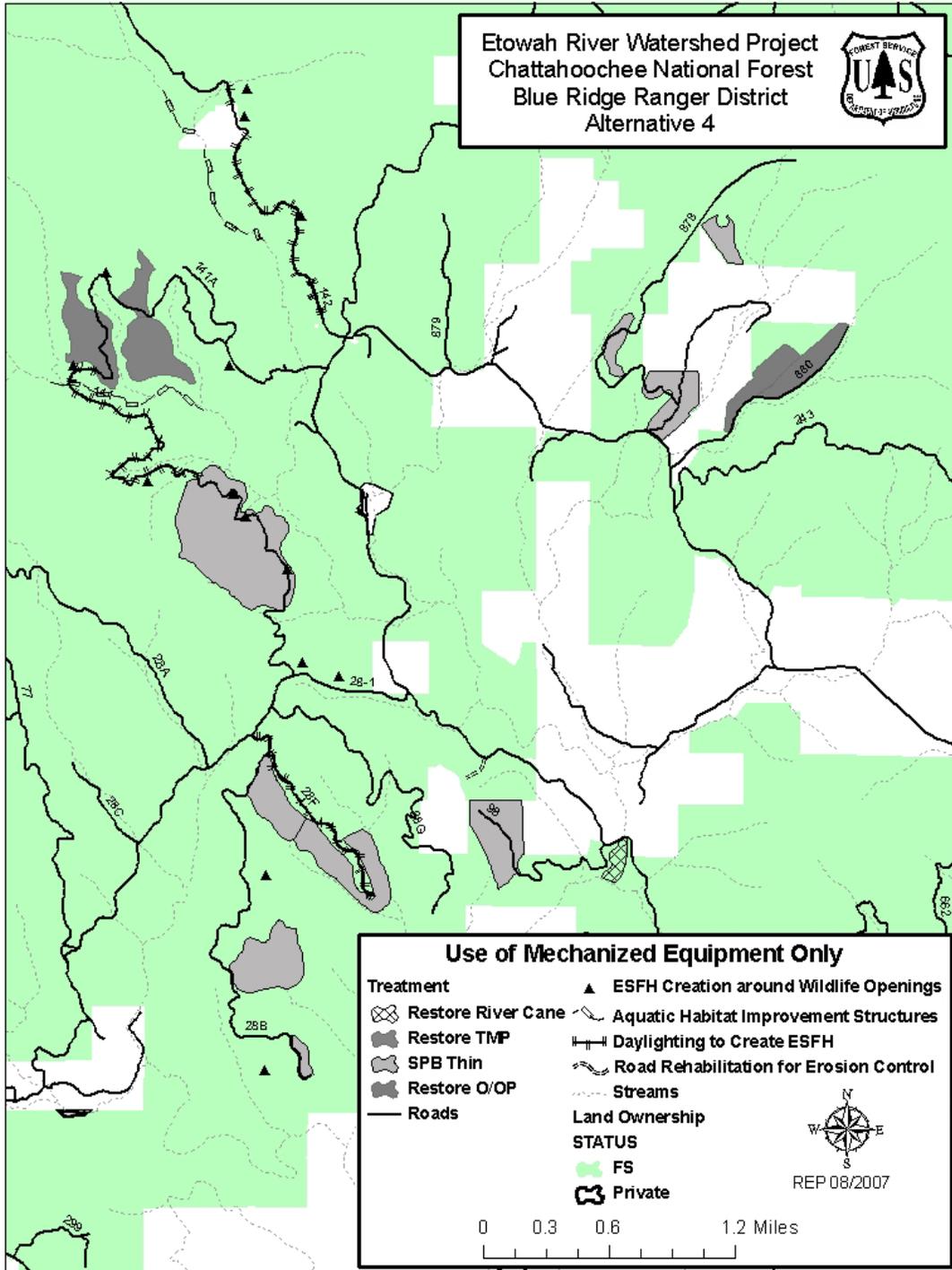


Figure 4: Map of Alternative 4.



2.3 Mitigation Measures Common To All Actions

- 1) In all stands that are to be thinned/restored, existing old skid trails and log decks will be utilized where possible, reducing the need to construct new skid trails and loading decks.
- 2) Erosion control measures (i.e. revegetation) will occur on skid trails and log decks where there is exposed soil within 30 days completion of activities in the area and water control structures will be built within 30 days of completion of activities in the area (Standards FW-066 & FW-067, Plan 2-22).
- 3) For all work proposed along FDR 28F, 28B and 141, the following mitigation measures will be followed to limit disruption of recreation activities occurring along the Jake/Bull Mountain Trail System and within the Blue Ridge WMA:
 - a. To the extent feasible, schedule project work during the winter season, and outside of organized hunts on the Blue Ridge WMA.
 - b. Information will be posted on the Chattahoochee – Oconee National Forest website and signs will be posted in the area describing the vegetation management activities and providing information on other hiking, biking, or horseback riding opportunities in the area for a period before and after the project implementation.
 - c. FDR 28B will be closed during the implementation phase of the project, with notices being posted at all intersecting trail crossings (Intersection 3K and 3L).
 - d. Reshape the dips and wing ditches of FDR 28F and narrow the track width to prior limits to retain the pre-existing character of the road.
 - e. After FS road 28F is used for hauling or skidding, the road will be lined with slash to deter off-trail travel, but no higher than 2 feet from the ground.
 - f. FDR 28F will be gated year round, and remain in use for administrative purposes, allowing non-motorized public use, only.
- 4) All streamside management zones will be protected in accordance to “Georgia’s Best Management Practices for Forestry” (Management Prescription 11 Standard 11-022, Plan 3-180).
- 5) 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.
- 6) Timber purchaser must remove any trash they bring into the area and their equipment must be washed when moving from one area to the next to prevent the spread of non-native invasive species.

- 7) Scenery Integrity Objectives (SIO) will be upheld by implementing the following mitigation measures:
- a. For project areas within stands 25 and 27 of compartment 571 classified with a SIO of HIGH, follow measures B, H, I, T and Y as identified in Appendix E.
 - b. For project areas within stands 28, 29 and 31 of compartment 571, which can potentially be seen from the Appalachian National Scenic Trail, follow measures B, I, T and V as identified in Appendix E.
 - c. For project areas within stands 19 and 21 of compartment 566 classified with a SIO of HIGH, follow measures B, D, E, F, G, I, T, V and Y as identified in Appendix E.
 - d. For project areas within stand 1 of compartment 566, which can potentially be seen from the Appalachian National Scenic Trail, follow measures B, I, T and V as identified in Appendix E.
 - e. For project areas within stand 1 of compartment 567 classified with a SIO of HIGH, follow measures B, C, D, E, F, G, I, T, V and Y as identified in Appendix E.
 - f. For project areas within stands 13 and 17 of compartment 586, which can potentially be seen from the Jake and Bull Trail System, follow measures B, D, T and AA as identified in Appendix E.
 - g. For project areas within stand 5 of compartment 567, which can potentially be seen from the Appalachian National Scenic Trail, follow measures B, I, T and V as identified in Appendix E.
 - h. For project areas within stand 10 of compartment 571, which can potentially be seen from the Appalachian National Scenic Trail, follow measures B, I, T and V as identified in Appendix E.
 - i. Shape and orient vegetative management openings in the forest canopy to contours and existing vegetation patterns to blend with existing landscape characteristics for all High and Moderate SIO areas. No geometric shapes shall be created.
 - j. Promptly rehabilitate firelines to appear natural in areas of High SIO.

2.4 Comparison of Alternatives

The alternatives are compared on how well they meet Forest Plan Goals and how well the issues are addressed. The effects of the alternatives are disclosed in Chapter 3 of the EA. Table 8 compares the proposed action and alternatives in terms of how they meet Forest-wide Goals and Objectives. Table 9 compares the estimated environmental effects that the proposed action and alternatives would have based on the significant issues.

Table 8: Comparison of Alternatives in terms of their ability to meet Forest-wide Goals and Objectives.

FOREST-WIDE GOAL	ALT. 1	ALT. 2	ALT.3	ALT. 4
Objective 9.F-03 - Restore table mountain forests on the Chattahoochee, reestablish these forest types on sites where they once likely occurred...(LMP 3-164).	NO	YES	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	YES
Objective 9.F-05 - Restore 200 acres of canebrake communities over the first ten years of plan implementation (LMP 3-165).	NO	YES	YES	YES
Objective 40.1 - Maintain forest-stocking levels at no more than 'fully stocked' for the species, age and site quality with priority for treatment given to those vegetation communities at highest risk of insect or disease attack.	NO	YES	YES	YES
Goal 2 - Early successional habitat will be well distributed in all forest types, elevations, aspects, and slopes including riparian corridors (LMP 2-4).	NO	YES	YES	YES
Goal 48 - Roads do not adversely affect soil and water resources (LMP 2-44).	NO	YES	YES	YES
Goal 24 – Maintain or restore soil productivity and quality (LMP 2-20)	NO	YES	YES	YES
Goal 26 - Restore and/or maintain aquatic ecosystems...capable of supporting viable populations of all native and desired nonnative species of aquatic flora and fauna within the planning area (LMP 2-21).	YES	YES	YES	YES

Table 9: How the Alternatives Address the Significant Issues

ISSUE	ALT. 1	ALT. 2	ALT. 3	ALT.4
<p>Significant Issue 1: Oak/Oak-Pine restoration areas in compartment 566, stands 19 & 21 will need further maintenance through use of herbicide, fire or mechanical equipment to keep out Virginia Pine and White Pine seedlings to maintain an Oak/Oak-Pine forest type. The measure that will be used to track this issue will be the acres of treatments (i.e. burning, mechanized removal of competition) needed to maintain the oak/oak-pine composition.¹</p>	0 ac.	119 ac.	270 ac.	216 ac.
<p>Significant Issue 2: Table Mt. Pine restoration areas will not promote Table Mt. Pine without further maintenance through use of herbicide, fire or mechanical equipment. The measure that will be used to track this issue will be the acres of treatments (i.e. burning, mechanized removal of competition) needed to maintain Table Mountain Pine.¹</p>	0 ac.	216 ac.	540 ac.	432 ac.
<p>Significant Issue 3: Thinning across Two Run Creek in compartment 566, stand 19 may cause increased sedimentation into Two Run Creek. The measure that will be used to track this issue will be acres of soil disturbance in riparian corridors in compartment 566, stand 19.</p>	0 ac.	27 ac.	0 ac.	0 ac.
<p>Significant Issue 4: Working in the Southwest portion of Compartment 566, stands 19 & 21 may cause increased sedimentation in Two Run Creek. The measure that will be used to track this issue will be acres of soil disturbance in riparian corridors in compartment 566, stand 19 & 21.</p>	0 ac.	27 ac.	0 ac.	0 ac.

¹ See Table 19 on page 52 in the Forest Cover section for additional details.

Chapter 3

Environmental Effects

3.1 Physical Environment

3.1.1 Watersheds

Element: Water

Measure: Acres of Disturbance

Bounds of Analysis: The temporal bound for cumulative effects on water resources is five years. The spatial bound includes all stream miles adjacent to the project area as well as the number of acres of disturbance within a watershed.

Existing Conditions

The project is located in the Upper Etowah River Watershed Management Area (5th level Hydrologic Unit Code (HUC) 0315010401). The project area is further divided into two unnamed 6th level HUCs. The bulk of the proposed action (approximately 985 acres) is in HUC #031501040101, with a small portion of the project area (approximately 6.6 acres) in HUC #031501040102.

The project is located in the Southern Blue Ridge Mountain Ecological Province. Landforms in this region include low mountains with broad, rolling ridges underlain by mica schist geology. Average annual precipitation in this region ranges from 65-70 inches per year. Headwater streams in the Southern Blue Ridge tend to be entrenched step/pool and pool/riffle systems with boulder and cobble substrate in riffles, and sand in pools. Most of the streams in the project area are low order, headwater streams. Sediment is the primary pollutant of concern in forested watersheds in the Southeast. Fine sediment (<2 mm in diameter) is a natural part of streams in this region, however, an excess of stored sediment in stream substrate is detrimental to aquatic habitat. Excess fine sediment in stream systems fills interstitial space between larger rocks and reduces the amount of available fish and macroinvertebrate habitat. Fine sediment enters the fluvial system when detached soils are eroded by moving water. Fine sediment is detrimental to habitat when the amount of sediment entering the fluvial system is not transported through the system under a normal flow regime. Most of the streams on the National Forest have excess stored sediment from past land management activities as well as the high erosive potential of micaceous soils in the region. Unpaved dirt and gravel roads are the primary contributors to stream sedimentation on the Chattahoochee National Forest (see the Roads section of this EA for a discussion of the roads in the project area) (VanLear, 1995). A desired condition is to reduce the amount of new and stored sediment in stream reaches.

Table 10 lists the numbers of stream miles by order located in the project area for the Proposed Action and Alternatives 3 and 4. The proposed action and alternatives also

include 0.5 miles of stream habitat improvement on the Etowah River and Montgomery Creek.

Table 10: Stream miles by order in the Proposed Action and Alternatives.

	First Order (mi)	Second Order (mi)	Third Order (mi)	Forth Order (mi)	Fifth Order (mi)	Total Stream Miles
Proposed Action	13.3	3.5	1.3	1.2	.4	19.7
Alternatives 3 and 4	12.6	3.3	1.3	.8	.4	18.4

Source: US Forest Service spatial data, 1:24,000 scale.

The bulk of streams in the project area are first order. First order streams have no tributaries and are primarily ephemeral and intermittent stream types. Ephemeral streams have no defined channel, and flow only in response to storm events. Intermittent streams have a well defined channel, but do not flow throughout the year. Perennial streams have a well-defined channel and flow throughout the year. Ephemeral streams differ from intermittent and perennial streams in that ephemeral channels do not have a hyporeic (or water-influenced) zone. Therefore, the vegetation and soils in these areas are different than those found adjacent to intermittent and perennial channels. Both ephemeral and intermittent channels are important inputs into the fluvial system because they connect to the perennial channel network, and because of the high density of these channel types in most watersheds. On the Chattahoochee National Forest, streams of second order and higher are usually perennial.

The largest perennial streams in the project area include Montgomery Creek, the Etowah River, Edmunston Creek, and Two Run Creek. Stream locations are on the map distributed during the scoping process. The project map is available on the forest website at <http://www.fs.fed.us/conf/sopa/forest-health-nepa.htm>. The streams in the project area are assigned a water use classification or beneficial use of fishing. Both Montgomery Creek and the Etowah River are classified by the Georgia Department of Natural Resources (DNR) as primary trout waters (Georgia Rules and Regulations for Water Quality Control, 2005). Streams with this designation support self-sustaining populations of rainbow, brown, or brook trout. The management conditions for trout streams designated by the Georgia DNR state that there should be no elevation of natural temperature in these streams. The Georgia Environmental Protection Division (EPD) has not listed any of the stream segments in the project area as not supporting this designated beneficial use; no streams in the project area are identified as partially supporting or not supporting on the State 305b Monitoring Report.

At the project area, the watershed area of Edmunston Creek is 225 acres. This small headwater stream is moderately entrenched and has a fairly high gradient of 4-6%. The stream is primarily sand and gravel-bottomed. A small area adjacent to the creek is proposed for pine thinning, and the stand is sufficiently far from the stream to protect water quality during this treatment.

At the project area, the watershed area of Two Run Creek is 733 acres. The stream is moderately entrenched and has a fairly low gradient of 2-3%. The stream substrate is dominated by small cobble, gravel, and sand. Forest Service Road 880 parallels Two Run Creek through the project area, but in most sections the stream is as far as 200 ft from the road. At present this road is delivering minimal sediment to Two Run Creek. However, if road conditions continue to worsen, the stream could be further degraded from erosion off Road 880. Parts of the Compartment 566 Stands 19 and 21 that are adjacent to Two Run Creek have steep slopes. As slope increases, erosion hazard also increases. Projects on these slopes could contribute excess sediment to Two Run Creek if BMPs are not followed. At the northern end of the project area, there is an abandoned culvert from an old road crossing that is not functioning and is resulting in streambank erosion.

At the project area, Montgomery Creek has a watershed area of 2,264 acres. The stream is slightly entrenched with a low gradient of 1-2%. The bottom of the stream reach that flows through the project area is dominated by gravels and cobbles with some fine sediment. The upper reach of Montgomery Creek through the project area (directly downstream of the crossing with FS Road 141) is channelized with homogeneous habitat, and excess stored sediment. Fish habitat structures are proposed downstream of the FS 141 crossing.

At the project area, the Upper Etowah River has a watershed area of 1,810 acres. This stream has been channelized and has an abundance of stored sediment. The section of the Etowah River above Camp Merrill is designated by the 2004 Land and Resource Management Plan as a source water protection area. Management emphasis on source water protection areas is to maintain watershed health to provide withdrawal for treatment and municipal use (USDA Forest Service, 2004c). Aquatic management activities are allowed to maintain, restore, and enhance aquatic conditions and associated communities of native and desired non-native or demand species. The proposed installation of fish enhancing structures in this stream will help achieve this goal. There is also a 700-ft reach of the main stem of the Etowah River proposed for canebreak restoration. The watershed area of the Etowah River at this site is 14,595 acres.

Management Prescription 11, Riparian Corridors, dictates direction for perennial and intermittent streams, and Chapter 2 of the Land and Resource Management Plan (LRMP) gives guidance for projects in ephemeral stream channels and other land management activities. Activities in this project will follow all guidelines in Management Prescription 11 (Plan 3-171).

Effects of Alternative 1 (No Action)

Treated Acres

This alternative proposes zero acres of ground disturbance in the project area.

Water and Aquatic Habitat Quality

This alternative will result in the least amount of sediment delivery to the aquatic system because there would be no ground disturbing activities in the project area. Normal

erosion would continue, and stream channels would continue to be altered through natural processes. Without maintenance, forest roads will continue to deliver sediment into adjacent streams. Specifically, road conditions on FS 880, FS 28F, and the unnamed road off Hightower Church Road will deteriorate further if maintenance is not performed.

The indirect effect of sediment delivery into the aquatic system is excess sedimentation. Sedimentation occurs when fine silt and sand fill the interstitial space between larger substrates. Although a natural part of the fluvial system (especially in the Southern Blue Ridge), excess sediment is often detrimental to habitat quality for coldwater fisheries in mountain streams (Wood and Armitage, 1997).

In the No Action Alternative, aquatic habitat conditions in the Upper Etowah River and Montgomery Creek will change only in response to other ground-disturbing activities and natural processes in the project area.

Cumulative Effects

There have been no projects in this area in the past five years, therefore there are no cumulative effects from the No Action Alternative. No future projects are proposed in the next five years in the project area.

Effects of Alternative 2 (Proposed Action)

Treated Acres

The proposed action includes approximately 847 acres in the treatment area with a suite of treatments taking place, including commercial timber harvest, chainsaw felling, tree girdling, prescribed burning, and installation of aquatic habitat improvement structures. There are approximately 19.7 stream miles adjacent to treatment areas. See Table 11 for treatment type by acreage. Refer to the Proposed Action Description in Chapter 1 for a complete discussion of the proposed treatments.

Table 11: Treatment type by acreage for Proposed Action.

	SPB Prevention	Restore Table Mountain Pine	Restore Oak/Oak- Pine	Early Successional Habitat Creation	Total
Initial Treatment Acres (Timber Harvest)	405	108	119	83	715
Rx Burning	0	240	0	0	240
Maintenance with Mechanical Equipment	0	0	0	0	0

Source: US Forest Service stand data, 1:24,000 scale.

Water and Aquatic Habitat Quality

Soil erosion from ground disturbing activities is a direct effect from the proposed activities including the construction of new roads, firelines, skid trails, and log landings. Erosion hazard from ground disturbing activities increases with steeper slopes, however, areas with slopes > 45% will not be treated. These ground disturbing activities result in an initial increase in the number of acres of exposed soils susceptible to erosion. The indirect effect of the proposed activities is sedimentation into streams in the project area. Sedimentation decreases the amount of quality habitat available for fish and other aquatic life.

No new permanent or temporary roads are proposed for the project. Road maintenance proposed in this Alternative will reduce erosion and sedimentation into streams in the project area through installation of drainage structures and re-surfacing.

Constructed firelines are the principal ground disturbing activity from prescribed burning. The project area proposed for this treatment is bound by Montgomery Creek to the south, and two unnamed tributaries of Montgomery Creek to the west and east. Only the northern border of the burning block will require a constructed fireline, resulting in approximately 0.77 miles of line construction.

There will be a temporary stream crossing constructed across Two Run Creek to connect FS 880 and the eastern portion of Compartment 566, Stand 19. This crossing would disturb approximately one acre. Short-term erosion would result during construction, however the effects of the crossing would be minimized by seeding and mulching exposed soils, and through proper construction of the crossing. This action would result in approximately 27 acres of soil disturbance* in Compartment 566, Stand 19 in the riparian corridor adjacent to Two Run Creek.

The water quality impacts of skid trails, log landings, and constructed firelines are short in duration; the recovery period for logging activities is estimated to be 3 years, and the recovery period for prescribed burning is estimated at 2 years (Dissmeyer and Stump, 1978). The impacts of these treatments on water quality will be minimized through the use of Georgia Best Management Practices (BMPs) and Forest Plan standards. Research in the southeast has shown that proper implementation of BMPs is effective in minimizing erosion (Phillips et. al., 2000, and Sun et. al., 2004).

Under the Proposed Action, fish structures will be installed in approximately 0.5 total stream miles in Montgomery Creek and the Upper Etowah River. Manual fish structure installation will result in some bank disturbance during construction, but vegetation growth will cover bare soils and stabilize banks. Once the structures are in place, they will provide quality habitat for trout and other aquatic organisms, and will contribute minimal loadings of excess sediment into these watersheds. Many of these structures will constrict the channel to flush excess sediment from low gradient reaches of both creeks.

* These acres of disturbance are approximate and were determined using GIS data in which the riparian corridor was mapped and then laid over the proposed activities.

Installation of fish structures will also promote a healthy pool-riffle sequence in treated reaches.

Cumulative Effects

There have been no projects in this area in the past five years; therefore there are no cumulative effects from past activities. No other future projects are proposed in the next five years in the project area.

Aquatic habitat quality will be maintained, and in most cases improved from the proposed activities. Erosion and sedimentation will be minimized through adherence to mitigation measures common to all alternatives, including Forest Plan standards, and BMPs.

Effects of Alternative 3

Treated Acres

The nature of the effects of this Alternative would be similar to the Proposed Action. However, the initial treatment acres have been reduced in Compartment 566 stand 21 from 28 to 26 acres and in stand 19 from 91 to 28 acres, bringing the treatment area down to 815 acres overall. This Alternative also proposes the use of mechanized equipment (162 acres) and/or burning (327 acres) to promote Table Mountain Pine (TMP) and Shortleaf Pine (SLP) regeneration. There are also fewer stream miles adjacent the treatment areas (approximately 18.4). See Table 12 for treatment type by acreage.

Table 12: Treatment type by acreage in Alternative 3.

	SPB Prevention	Restore Table Mountain Pine	Restore Oak Oak-Pine (Thin)	Early Successional Habitat Creation	Total
Initial Treatment Acres (Timber Harvest)	405	108	54	83	650
Rx Burn	0	240	87	0	327
Maintenance with Mechanized Equipment	0	108	54	83	245

Source: US Forest Service stand data, 1:24,000 scale.

Water and Aquatic Habitat Quality

Since treatment acres are reduced, the effects of this Alternative on aquatic habitat quality would initially be less than in the Proposed Action, however there will be a longer duration of ground disturbance in this Alternative.

The portion of the project area that has been removed from Compartment 566, Stand 21 in this Alternative is on ground with greater than 30% slope adjacent to Two Run Creek. A portion of Compartment 566, Stand 19 on the southeast side of Two Run Creek has also been removed from this Alternative. Removal of this portion of Stand 19 will eliminate the need for a crossing of Two Run Creek. This action would result in approximately 0 acres of soil disturbance* in Compartment 566, Stand 19 in the riparian corridor adjacent to Two Run Creek. The removal of these portions of stands will reduce erosion, and sedimentation into Two Run Creek.

The follow-up treatment with mechanized equipment will result in a longer duration of potential sediment loading, however the type of treatment proposed (chainsaw felling) will minimize impacts to aquatic habitat conditions. Generally there is little ground disturbance associated with mechanical treatments to remove undergrowth in recently treated stands. There is also minimal ground disturbance associated with the maintenance of ESFH created around wildlife openings as proposed on 34 acres. These activities will result in very little erosion and sedimentation into streams in the project area.

Approximately 0.71 miles of additional fire lines will be constructed in Compartment 566, Stands 19 and 21 in this Alternative. There will also be 0.77 miles of fireline used in the initial treatment that would be reused for follow-up prescribed burning in Compartment 571. Fireline placement, construction, and maintenance will follow Georgia BMPs and Forest Plan standards.

Cumulative Effects

There have been no projects in this area in the past five years; therefore there are no cumulative effects from past activities. No other future projects are proposed in the next five years in the project area.

Aquatic habitat quality will be maintained, and in most cases improved from the proposed activities. Erosion and sedimentation will be minimized through adherence to mitigation measures common to all alternatives, including Forest Plan standards, and BMPs. Fish structures will reduce sedimentation and increase habitat availability in the project area.

Effects of Alternative 4

Treated Acres

The overall treatment area is reduced to 650 acres. Alternative 4 acres are reduced by 327 due to the elimination of prescribed burning (see Table 13). There are approximately 18.4 stream miles adjacent to treatment areas.

* These acres of disturbance are approximate and were determined using GIS data in which the riparian corridor was mapped and then laid over the proposed activities.

Table 13: Treatment type by acres for Alternative 4.

	SPB Prevention	Restore Table Mountain Pine	Restore Oak Oak- Pine	Early Successional Habitat Creation	Total
Initial Treatment Acres (Timber Harvest)	405	108	54	83	650
Rx Burn	0	0	0	0	0
Maintenance with Mechanized Equipment	0	108	54	83	245

Source: US Forest Service stand data, 1:24,000 scale.

Water and Aquatic Habitat Quality

This Alternative is the same as Alternative 3 except there would be no prescribed burning. Erosion and sedimentation as well as aquatic habitat conditions that result from this Alternative are expected to be the same as in Alternative 3.

Cumulative Effects

There have been no projects in this area in the past five years; therefore there are no cumulative effects from past activities. No other future projects are proposed in the next five years in the project area.

Aquatic habitat quality will be maintained, and in most cases improved from the proposed activities. Erosion and sedimentation will be minimized through adherence to mitigation measures common to all alternatives, including Forest Plan standards, and BMPs.

3.1.2 Soils

Element: Soils

Measure: Soil productivity

Bounds of Analysis: The temporal bound used for cumulative effects on soil productivity is three to five years; the spatial bound includes all soils where management activities are proposed.

Existing Conditions:

The Etowah River project area is situated within the Southern Blue Ridge Mountains Ecological Subsection (M221Dc). This subsection is one ecological level of land classification used to arrange and order information about land units. The current ecological classification system in use by the Forest Service is divided in a hierarchical framework (Cleland et. al, 1997) to delineate ecological units at different levels of scale that have similar capabilities and potentials for management. At the broad landscape scale of the eastern United States the ecological units are the Humid Temperate Domain (200), Hot Continental Division (220), Central Appalachian Broadleaf Forest-Coniferous Forest – Meadow Province (M221) and the Blue Ridge Mountains Section (M221D). Each of these units describe similarities in climate, vegetation communities and patterns, topographic features, geology and soil types, disturbance regimes, and elevations.

At the scale of the Chattahoochee National Forest the ecological units applicable to Forest Plan implementation are Subsections and Landtype Associations. The Southern Blue Ridge Mountains subsection is briefly described as follows: low mountains (elevation 2000-5000 feet), 35 to 55 inches annual precipitation, average annual temperature 50-60 degrees, growing season 150 to 220 days, and perennial streams common. This area extends from its southern extent in the mountains of Georgia north through North Carolina into the southern border of Virginia. Within the boundaries of the Chattahoochee National Forest Landtype Associations (LTA) are delineated at the Forest scale with similarities at the level of project activities. The Etowah River project is located within the following two LTAs:

Landtype Association M221Dc018 – Suches: generally located along the prominent southern “face” of the Blue Ridge Mountains rising above the Piedmont in Georgia, extending from Burnt Mountain near Jasper northeastward to Big Buzzard Mountain near Turners Corner north of Cleveland. Terrain include rugged mountain crests with steep descending side slopes, numerous perennial streams and total relief of about 1900 feet. The Appalachian Trail follows the high ridges within this LTA. Landform and topography in these ecological units is characterized by low mountains with broad, rolling ridges underlain by mica schist geology. Valley bottoms along large creeks and rivers have broad stream terraces; however none occur within the project area. Within the Etowah River project area elevations range from 1500 along the Etowah River to 2200 feet near the peak of Little Sal Mountain in Compartment 571. Average annual precipitation within the Landtype Association is about 75 inches (near Suches), primarily due to the elevation of the Blue Ridge Divide within the LTA. The southern facing slopes receive lower precipitation amounts. Average annual temperature is estimated at 61° and growing season of 185 to 200 frost-free days. North slopes are relatively cooler and damper, while south and west facing slopes tend to be warmer and drier. Slope gradients range from 10 to 70 percent, with lower gradients of 0 to 5 percent along the ridge crests and valley floors along streams.

Landtype Association M221Dc037 – Chestatee Foothills: generally located from Amicalola Falls State Park northeast to US 129 at Town Creek, includes portions of the “Dahlonge Plateau” or “Dahlonge Upland.” This LTA is distinguished by lower slopes

of the Blue Ridge Mountains adjacent to the Piedmont, but recognized as being in the Blue Ridge based on increasing rainfall and occurrences of Appalachian tree species such as hemlock and eastern white pine. Geology is primarily mica schist and gneiss. Landforms are narrow ridges of moderate relief trending southward with moderately steep sideslopes and narrow valleys. Relief and elevations decrease slowly and gradually to the south. Elevation ranges from 1400 to 1900 feet. Higher crests include Campbell Mountain to the east of the project areas. Average annual precipitation is estimated at 64 inches with a growing season length of 205 days. Slope gradients range from 10 to 40 percent, with lower gradients along ridge crests and valley floors along streams.

The upland terrain soils within the Etowah River project area are well developed soils, generally deep (greater than 40 inches to bedrock), well drained, and moderate to high in productivity for forest tree species. Surface soil textures are loam and fine sandy loam with subsoil textures ranging from loam to clay. Soil depth over bedrock is typically more than sixty inches thick on the sideslopes and in cove positions. Depth of soil material often becomes shallower along ridges, typical of the Tallapoosa series found near the crest of mountain ridges, with soil material over bedrock 20 to 40 inches thick.

Soil inventory information for this project was evaluated from the Dawson-Lumpkin-White Counties Soil Survey, published cooperatively by the USDA Natural Resources Conservation Service and the Forest Service in 1972. Field surveys were conducted by soil scientists from these agencies from 1960 to 1965 with National Forest lands surveyed by Forest Service soil scientists (USDA-SCS, 1972). Field visits were completed within the project areas in February and May 2007 to examine current soil conditions in the project areas, identify compaction sensitive areas, slope breaks and other soil interpretations needed to design management activities.

Soils of the Etowah River project area have been classified into fourteen (14) soil series, and further divided into 20 individual soil mapping units. The series are named and generally located by landform position as follows:

Lower slopes along stream terraces and floodplains: Cartecay, Congaree, Starr, Toccoa and Wickham

Middle and lower slopes: Fannin, Wickham and Tallapoosa

Upper and middle slopes: Ashe, Edneyville, Hayesville, Hiwassee, Musella, Porters, and Tusquitee

Soil mapping units are used to identify soil types as they occur on the landscape. These delineations can be used to identify landform position, chemical and physical soil properties, and further evaluated to interpret the mapping units for risks or hazards, and various treatments. Some mapping units may have two or more soil series within the delineations, called complexes, due to the nature of the landscape geology and topography. This is common in montane topography with long side slopes and ridgetops. Soil properties, landscape positions, existing condition of soil units, and the associated management implications or precautions of these soil units were analyzed with respect to the effects of proposed practices in each alternative. The specific soil mapping units are

identified in the table below with slope gradient, acres/percentage in the project area, and the interpreted soil erosion and compaction hazard.

Table 14 below displays information on six soil mapping units within the project areas that occupy more than 30 acres as a map unit as measured by GIS analysis. These acres make up 92% of the project area soils. The remaining soil mapping units (8%) occur in polygons totaling less than 30 acres as a map unit within the project areas and are described in a narrative format below the table.

Table 14: Major Soil Mapping Units Found in Etowah River Project Area.

Soil Map Unit Name	Slope Gradient Range	Acres in Project Area	% Of Project Areas	Harvesting Limitations	Compaction Hazard	Erosion Hazard
Edneyville and Porters loams (EPF)	25 to 60	30	4	Moderate	Slight to Moderate	Moderate
Fannin fine sandy loam (FaC, FaE)	10 to 25	39	5	Moderate	Moderate	Moderate
Hayesville fine sandy loam (HIE)	10 to 25	86	13	Moderate	Moderate	Moderate
Hiwassee loam (HSC, HSD, HSF)	10 to 15	85	13	Moderate	Slight to Moderate	Severe
Tallapoosa soils (TdE, TdG)	25 to 70	335	49	Moderate to Severe	Moderate	Moderate to Severe
Tusquitee stony loam (TIC, TID, TmE)	10 to 25	53	8	Moderate	Moderate	Moderate

Minor Soil Mapping Units – The following soil mapping units within the Etowah River project area occur within areas less than 30 acres by soil mapping unit as mapped and make up approximately eight (8) percent of the total project acres.

<u>Map Unit Name</u>	<u>Acres in project Area</u>
Ashe and Edneyville stony loams (AEF)	4.3
Cartecay complex (CaC)	6.5
Congaree and Starr soils (Con)	6.4
Musella cobbly loam (MCE, MCG)	6.0
Starr fine sandy loam (Sta)	1.0

Tusquitee stony loam (TmE)	1.7
Toccoa soils (ToC)	8.0
Wickham fine sandy loam (WgD)	14.0

Within the Etowah River project area soil mapping units along the Etowah River and larger streams such as Montgomery Creek and Two Run Creek are subject to flooding. Based on the soil survey mapping these mapping units are subject to occasional flooding 5 to 50 percent chance in any year, with flood events being of short duration (48 hours or less). Management activities within these delineations need to be designed to allow flood passage and minimize restriction of these brief floods. Permanent facilities such as road crossings of streams require designs to accommodate storm flows that will pass floods without causing damage to the crossing or upstream floodplain. Short-term activities such as timber removal need to be conducted during seasons of low risk of flooding such as summer and fall months.

An evaluation of the soil maps and National Wetland Inventory maps was conducted to identify any known jurisdictional wetlands, source water intakes or prime farmlands within the project area. No occurrences of wetlands large enough in acreage to be mapped were identified. Small isolated riverine wetlands occur in the floodplains such as Montgomery Creek and Two Run Creek. No prime farmlands occur within the project area. The Department of Defense (DOD-US Army) currently operates a source water intake on the main channel of the Etowah River at Camp Merrill treating potable water for base operations and fire protection. The facility is a package treatment plant permitted to withdraw up to 0.5 million gallons per day. The area upstream of the intake is identified in the Forest Plan as Management Prescription 9.A.1. Source Water Protection. A source water protection plan has been completed by the DOD-US Army for this watershed.

For additional information concerning these soil map units and additional management interpretations, reference the Soil Survey of Dawson, Lumpkin and White Counties, Georgia, on file in the Forest Supervisors office.

The project proposes to restore table mountain pine (*Pinus pungens*) in Compartment 571 – stands 27, 29 & 31, with the burning unit containing portions of stands 35, 34 & 32. These stands are generally located along FS Road 141, west of the Camp Merrill Training Facility, and in the headwaters of Montgomery Creek. These stands are characterized by moderately steep to steep sideslopes and ridgetops with a generally south or west facing aspect, elevations 1800 to 2000 feet. Soil mapping of these stands identified most of the area as Tallapoosa soils (map symbol TdG). Tallapoosa soils are described as shallow, well drained, moderately permeable soils formed from mica schist. Soil depth in the Tallapoosa series ranges from 10 to 20 inches with depth to hard bedrock more than six feet. These soil properties combined with climate factors create a xeric site, well suited to table mountain pine and other dry site species.

Effects on Soils

Soil Erosion - Soil erosion is recognized as potentially the most serious, direct form of damage to soil productivity. Soil can be permanently lost and soil particles physically moving from a site may result in sediment delivery to nearby streams impacting water quality and possibly compromising aquatic habitats. Ground, or soil, disturbing management practices have the greatest potential to cause erosion, principally because they remove vegetative ground cover and often concentrate and channel surface runoff water. Research has shown that access routes and systems, along with impact areas of log decks and primary skid trails are the most common causes of accelerated erosion that occur in forested watersheds. In addition, erosion rates will tend to remain greater on these areas for one to three years following their use due to altered soil structure and loss of infiltration and until vegetation cover is restored.

A soil's susceptibility to erosion varies by soil type and position on the landscape. A slight or moderate erosion hazard indicates that standard erosion control measures such as installing waterbars plus seeding and fertilizing firelines and not exposing more than 15 to 25 percent of mineral soil in treatment areas are sufficient to prevent excessive erosion. Soils with severe erosion hazard ratings require more intensive efforts to reduce the potential for accelerated erosion both during and after the soil disturbing activity.

Soils of the Tallapoosa series (TdG) occurring on slopes ranging from 25 to 70 percent within the project areas have a moderate to severe erosion soil rating. Slopes in excess of 40 percent would be rated as severe. This soil mapping unit (TdG) occurs in Compartment 571, stands 29 and 31, and Compartment 586, stands 01 and 04. These stands are proposed for cutting treatments to restore table mountain pine and oak.

This interpretation identifies the risk of erosion when soils are exposed and not protected by vegetation cover. To reduce this risk, mitigation measures will be implemented for all action alternatives to minimize soil erosion. These measures could include location of access routes on appropriate locations (slope and gradient), water control on access routes, and prompt revegetation of exposed soils when use is completed. These measures would be followed in accordance with the Forest Plan and Georgia's Best Management Practices for Forestry, and monitored for compliance by Forest Service personnel.

Soil Compaction - Compaction, or soil rutting, increases soil bulk density and decreases porosity as a result of the application of forces such as weight and vibration caused by the operation of heavy equipment used in forestry operations. One of the major soil concerns when operating heavy equipment in the forest is soil compaction; the primary method to minimize this impact is to operate equipment on designated routes during drier soil moisture periods. Compaction can detrimentally impact both soil productivity and watershed condition by causing increased overland flow during storm events. Plant growth can be reduced due to a combination of factors including lower amounts of water entering the soil and its reduced availability to plant growth, a restricted root zone, and reduced soil aeration. It is generally acknowledged that all soils are susceptible to soil

compaction or decreased soil porosity. Soils in the Etowah River Watershed project area are most susceptible to compaction or rutting when wet.

A severe rating indicates that soils will easily compact when soil moisture is at or above soil moisture field capacity. The soils in the project have a moderate rating for soil compaction. This indicates that under most field conditions compaction will not be a problem, but may occur when soil moisture content is at or above field capacity. Mitigation measures proposed for all action alternatives to minimize compaction would be followed in accordance with the Forest Plan, generally restricting equipment operations when soils are saturated.

Soil Displacement - The use of large machinery in forestry operations may affect soil productivity by soil displacement. Soil displacement is described as the horizontal movement of soil from one place to another by mechanical forces such as a blade, wheel slippage, or dragging logs. Displacement has negative effects on productivity because it removes the area of highest concentration of organic matter and nutrients from soil and significantly reduces soil biological activity.

Soil Nutrients (organic matter) - Loss of soil nutrients can occur directly from soil erosion, soil displacement, or indirectly by biomass removal from harvesting timber, or from fire. The most effective way of managing soil organic matter is through effective management of the forest floor and woody debris. Nutrient depletion, however, is generally a concern where soils are initially nutrient poor, where whole-tree harvest (total biomass removal) is used, or where stand rotations are very short, i.e. on the order of 20 to 35 years (Jorgensen and Wells, 1986). None of these factors apply in this project area, or from proposed management actions being considered.

A large portion of the total nutrient supply of the forest ecosystem is contained in the forest floor (duff layer) and decaying woody debris. These materials are important because they are the reservoir for soil organic matter and short- and long-term nutrient supply. The forest floor and decaying woody debris also serves to improve soil infiltration, aeration, and retention of soil moisture, and provide needed habitat to support soil microbial activity for the forest ecosystem.

Prescribed Fire Effects on Soil - Prescribed fire has both favorable and adverse effects on soil. Favorable effects are temporarily enhanced nutrient availability and phosphorus cycling and reduced soil acidity (FEIS-Appalachian Mountains, IV-90). Adverse effects include excessive soil heating that can kill soil biota, alter soil structure, destroy organic matter, and loss of site nutrients through excessive volatilization. Soil erosion and additional nutrient loss through leaching may occur during rainstorms. Negative effects are principally related to the severity and frequency of the burn.

High intensity burns, more typical during wildfires, can adversely affect long-term soil productivity. Such things as excessive nutrient loss from the site through atmospheric volatilization and deep leaching, loss of soil organic matter and even soil structure and

reduced infiltration rates can be seriously compromised, further leading to accelerated erosion rates.

Management actions, however, have been proposed to conduct prescribed burns in properly managed conditions to produce a low to moderate fire intensity. During prescribed burning actions sufficient amounts of unburned material would be left to minimize erosion. Burns would be implemented such that not more than 15 percent bare soil would be exposed on units receiving fuels reduction or wildlife habitat burns. Soil exposure occurs primarily within bladed fire control lines. Dormant season underburns every 3 to 5 years pose minimal risks to soil quality on most sites (FEIS-Appalachian Mountains, II-B-22) would result in little to no detectable change of the structure of mineral soils because the elevated temperatures in the soil would be less and of brief duration (i.e. the fire would not stagnate in one spot for long periods of time). Light to moderate-severity burns would expose soil on less than 20 percent of the area and vegetative recovery would usually take one year or less. Soil biota would also be temporarily reduced but would recover quickly.

The proposed prescribed burns would occur every 3 to 5 years during the dormant season and be of low to moderate intensity. Some of the prescribed burns would occur on slopes greater than 35 percent. Only the upper forest floor litter layer consisting of non-decomposed or semi-decomposed pine needles, leaves and small twigs should be consumed. This would leave the underlying layer, which consists of more decomposed needles, leaves and twigs, to protect the soil from excessive nutrient loss. This organic layer, along with the trees and other living vegetation on the site, would also serve to prevent or minimize any soil movement.

Effects of Alternatives on Soils

Alternative 1: No Action

This alternative proposes no treatment actions within the project area.

Direct and Indirect Effects

Erosion: This Alternative would result in the least amount of direct erosion. Only undisturbed natural erosion would be expected to continue, along with erosion from the existing system roads in place. Current levels of road use, along with regular maintenance, would minimize erosion from the road prism. A significant indirect effect due to the implementation of this alternative would be the effects that a wildfire could have to soil productivity in the project area. Under this scenario, the No Action Alternative would represent the most detrimental situation as existing high fuel loadings along with more limited fire suppression equipment access into this area would equate to the most acres that could be affected by wildfires.

Compaction and Displacement: No soil disturbing activities would be planned in the No Action Alternative. Therefore, there would be no direct or indirect effects on the soil from implementation of this alternative as no heavy equipment use would be planned.

Nutrient Loss: The No Action alternative would result in no direct nutrient depletion. However, in the event of a wildfire the nutrient loss could well be the most excessive of any of the four alternatives. Under this alternative a wildfire would be expected to impact the most acres as a high severity level. In the event of a wildfire, the excessive amount of nutrient depletion would make this alternative the worst of the four analyzed when taking account the indirect and cumulative effects that would occur.

Considering only direct effects, the existing trends would continue. The No Action Alternative would be considered the least effective in terms of maintaining long term soil productivity.

Cumulative Effects

No cumulative effects would result from past projects, e.g. salvage activities from storms in 1993 and 1994, as these past projects were completed more than 10 years ago and no effects remain. No other future actions are proposed during the temporal and spatial bounds used for the project area.

Alternative 2: Proposed Action

Refer to the Proposed Action description in Chapter 1 for a detailed discussion of the proposed treatments. Treatments would occur on approximately 847 acres in the Project Area. Areas to be harvested are proposed on ridge crests and mid-slopes.

Direct Effects

Erosion: In the Proposed Action the primary areas of concern for erosion would be use and maintenance of the Forest Service system roads identified for access to projects, temporary access roads into harvest areas, log landings, skid trails, and fire control lines for the prescribed burns planned after the commercial timber harvest. All of the Forest Service system roads identified for the project are existing roads – no construction or reconstruction will be required for the project. FS Roads 98, 878 and 880 will require pre-operations maintenance to provide surface drainage and spot gravel as needed. Temporary access route locations are in place from previous timber management activities, generally following the ridge crests and upper side slopes. The slopes and soils of these landscape positions are suitable for access routes, and development will require minimal excavation disturbance. Development and use of these temporary roads will disturb approximately 2.0 acres per mile constructed. These existing routes generally require minimal excavation of the roadbed, restoration of drainage structures and then closure and revegetation at the end of operations to stabilize disturbed soils. Log landings will need to be developed within the treatment areas to concentrate logs for removal. Average size for a log landing is about one-quarter acre or less during

operations. Efficient operations would require on average one (1) landing per 7 to 8 acres of harvest area, disturbing from one-fourth to one-half acre per landing.

A temporary stream crossing will need to be developed to connect FS Road 880 across Two Run Creek to provide temporary access to the portion of Compartment 566, Stand 19 on the east side. A suitable location has been identified that can be used with either a culvert pipe crossing or possibly a ford. Construction of this crossing would require excavation, shaping, placement of either the pipe or stone in the stream, placement of fill material to form the travel surface for the vehicles. Short-term erosion would result during construction; however this would be mitigated by use of seeding and mulching the exposed soils. Development and use of this crossing would disturb about one acre including the approaches and the crossing area. When the sale activity is completed this temporary crossing would be removed and the approaches to the channel stabilized to return to a natural condition.

Prescribed fire is proposed as a follow-up treatment after the harvest to develop and maintain desired conditions. Fire control lines will need to be developed prior to the implementation of prescribed burns (following the completion of harvest operations), but would have repeat use for subsequent prescribed burns. Each of these soil disturbances (temporary roads, log landings, stream crossings, fire control lines) will be implemented under Forest Plan standards and Georgia's Best Management Practices for forestry to minimize erosion and loss of soil productivity within the project area. Areas of soil disturbance will be stabilized and restored to vegetation cover after operations end to minimize soil erosion. Monitoring has shown that these measures, when properly implemented, are effective at minimizing erosion. Implementing the Proposed Action Alternative, therefore, should result in no long term effect on soil productivity.

Compaction: The majority of the soils of the Etowah River project area are rated with a moderate compaction hazard rating within proposed treatment areas. Soils in the lower slope positions and in riparian corridors typically have a moderate to severe hazard rating for compaction. This rating is primarily due to low proportions of rock content in the top six inches of soil, and the clay content at this same depth. Most of the area within riparian corridors will not be disturbed during operations, offering mitigation of this potential damage. Treatments on all soils will require attention to soil moisture levels during operating periods and adherence to Georgia's Best Management Practices for Forestry and Forest Service timber sale contract provisions related to wet period operations to minimize damage from compaction.

Soil Displacement: The Proposed Action Alternative would result in some soil displacement from skidding of logs, and dozer constructed firelines, log decks, and temporary road construction. Where these actions are being dedicated to these uses for future management actions, soil displacement is acceptable. Implementing mitigation measures referenced in the Forest Plan and Georgia's Best Management practices for Forestry would result in displacement having only a minimal impact to soil productivity.

Nutrient Loss: Some short-term loss in nutrient resources is expected due to tree harvest and prescribed burning which results in some biomass removal, accelerated erosion, volatilization and deep leaching. These effects may continue for up to two years following project implementation. On the positive side, harvesting and prescribed burning will temporarily increase availability of nutrients resulting in improved vegetative growth during this same period.

All timber harvesting would result in the removal of tree boles only. The prescribed burns would be conducted every 3 to 5 years during the dormant season with a low to moderate severity. This means that, in addition to the targeted fraction of 10-hour (1/2 “ dbh) and larger fuels planned for consumption, only the upper forest floor litter layer consisting of non-decomposed or semi-decomposed pine needles, leaves and small twigs would also be consumed. Most of the nutrient resources would remain onsite by leaving the underlying layer, which consists of more decomposed needles, leaves and twigs, intact and unburned. This remaining organic layer, along with the residual canopy position trees, unconsumed slash and other large woody debris and other living vegetation, would serve to minimize the temporary loss of the nutrient resources. Implementing this action alternative would result in no long-term effect on the soil nutrient resources.

Indirect Effects

Fire Effects and Soil nutrients: Long-term negative effects to the soil should be minimal under the proposed treatment of low to moderate intensity prescribed burns on a 3 to 5 year frequency. Typical burn intensity will be limited by established burning parameters and Forest Plan mitigation measures designed to protect soils and overstory trees and to minimize risk of escape. These parameters result in retention of enough leaf litter to protect soil from the negative effects listed above in most cases. Underburn frequencies will be one to four years or greater which would allow recovery of forest floors and soil biota and would not deplete soil nutrients.

With standard prescribed burn planning and mitigation, negative effects to soil productivity from prescribed fire under the proposed action alternative are not expected. This is because the burns would be light to moderate in severity and cool enough to protect overstory trees, and the lower portion of the litter layer would remain in place.

Cumulative Effects

No effects would result from past projects, e.g. 1994 storm salvage of timber, as these past projects were completed more than 10 years ago. No other future actions are proposed during the temporal and spatial bounds used for the project area.

The effect to long-term soil productivity as a consequence of those actions being proposed in this Alternative relates to the cumulative effects from erosion, compaction, displacement and the soil nutrients capital as noted above. By practicing a light hand on

the land policy during all soil disturbance activities, by adhering to mitigation measures common to all action alternatives and following all applicable Forest Plan standards and Georgia's Best Management Practices for Forestry, long-term soil productivity would be maintained. In addition, fuel loadings throughout most of the project area would be reduced from timber harvesting and prescribed fire and the construction of temporary roads would improve access for fire suppression needs. These actions would reduce the probability of a future accumulation of fuels and wildfire hazard, which could impair long-term productivity.

Alternative 3

Direct and Indirect Effects

Direct and indirect effects of Alternative 3 on soil productivity would be lower than the Proposed Action. Two changes to proposed treatments were developed to address public comments related to treatment impacts on Two Run Creek in Compartment 566, Stands 19 and 21. The changes would have a direct effect on potential soil erosion and an indirect effect of reducing sedimentation: (1) Remove portion of Compartment 566/Stand 19 on the SE side of Two Run Creek; and (2) Remove the SW portion of Compartment 566/Stands 19 & 21 on the SW side of Two Run Creek. Removing these two areas from proposed timber harvest will result in a direct effect of reducing ground disturbance within the harvest areas and drop the need for a stream crossing of Two Run Creek to provide access between FS Road 880 and Stand 19. This would result in lower potential for erosion within the project area, and reduced soil disturbance within the riparian corridor of Two Run Creek.

An additional change to proposed treatments in Alternative 3 is to use mechanized equipment and/or prescribed burning to control competition and promote Table Mountain Pine in Compartment 571, Stands 31, 29, and 27 in the future when fuel loadings and regeneration quality are appropriate. The burn area will also include portions of stands 35, 34 and 32 which adjoin stands 31, 29, and 27. Similar treatments are proposed to promote shortleaf pine and control competition in Compartment 566, Stands 19 & 21. Therefore, the areas proposed for treatment are reduced from 817 acres to 752 acres. The potential effects of soil erosion, compaction, displacement and nutrient loss would decline in proportion to the reduced acreage proposed for management treatments. This reduction in treatment acres will reduce acres treated by timber harvest, the overall miles of temporary roads and skid trails, and log landings.

Cumulative Effects

No cumulative effects would result from past projects, e.g. 1994 storm salvage of timber, as these past projects were completed more than 10 years ago and no effects remain. No other future actions are proposed during the temporal and spatial bounds used for the project area.

The effect to long term soil productivity as a consequence of those actions being proposed in the Proposed Action Alternative relates to the cumulative effects from erosion, compaction, displacement and the soil nutrients capital as noted above. By practicing a light hand on the land policy during all soil disturbance activities, by adhering to mitigation measures common to all action alternatives and following all applicable Forest Plan standards and Georgia's Best Management Practices for Forestry, long-term soil productivity would be maintained. In addition, fuel loadings throughout most of the project area would be reduced from timber harvesting and prescribed fire and the construction of temporary roads would improve access for fire suppression needs. These actions would reduce the probability of a future accumulation of fuels and wildfire hazard, which could impair long-term productivity.

Alternative 4

Direct and Indirect Effects

Effects of Alternative 4 would be the same as described for Alternative 3 except the control of competition species will use mechanized equipment only in Compartment 566, stands 19 and 21, and Compartment 571, stands 27, 29 and 31.

Cumulative Effects

Cumulative effects of Alternative 4 would be the same as described for Alternative 3.

3.2 Biological

3.2.1 Forest Cover

Element: Forest cover

Measure: Acres by type of forest cover

Bounds of Analysis: Spatial analysis bounds will include predicted impacts to immediate and adjacent forest communities and the forest landscape (Etowah River Sixth Level Hydrologic Unit (Etowah HU), containing approximately 12,895 acres). The temporal bounds will be over the next 10-15 years.

Existing Conditions

Forest types across the Etowah HU include the following forest types, with mixes of oak-hickory, white pine, yellow poplar, and southern yellow pines dominating most of the forest communities (Table 15).

Table 15: Forest Types within the Etowah River Sixth Order Hydrologic Unit

Description	# Stands	Acres	% of HU
White oak - red oak - hickory	94	3,236	25%
Yellow poplar - white oak - red oak	38	1,243	10%
White pine	36	1,185	9%
Upland hardwoods - white pine	35	1,125	9%
Chestnut oak - scarlet oak - yellow pine	30	1,124	9%
Virginia pine	26	726	6%
Shortleaf pine	20	640	5%
Virginia pine - oak	21	625	5%
White oak - black oak - yellow pine	20	556	4%
White pine - upland hardwood	16	536	4%
Shortleaf pine - oak	17	455	4%
Loblolly pine	12	346	3%
Cove hardwoods - white pine - hemlock	9	247	2%
Bottomland hardwood - yellow pine	4	209	2%
Chestnut oak	9	207	2%
Unclassified	1	166	1%
Yellow poplar	7	146	1%
White pine - Cove hardwood	2	80	1%
Scarlet oak	1	20	0%
White oak	1	12	0%
Totals...		12,884	100%

Table 16: Age Class Distribution of National Forest System Land in the Etowah River HU

Age Range (years)	Number of Stands	Acres	% of HU
0-10	0	0	0%
11-20	18	489	4%
21-30	37	998	8%
31-40	23	1,249	10%
41-50	14	782	6%
51-60	21	451	3%
61-70	15	457	4%
71-80	32	1,126	8%
81-90	60	1,751	14%
91-100	54	1,484	12%
101-110	58	2,079	16%
111-120	35	1,018	8%
121-130	25	790	6%
131-140	5	164	1%
141-150	2	46	0%
Non-forested	3	11	0%
	Total Acres:	12,895	100%

Age class diversity across the landscape is skewed toward the older age classes when examining 10-year increments (Table 16). Over half (57%) of the forest communities in the Etowah HU are over 80 years old and there are no forest communities that are a decade or less in age. There are some small pockets of southern pine beetle damage dating back to the 1999-2002 epidemic, however this acreage is negligible (less than 30 acres estimated) across the entire HU.

Old growth forests are defined in Appendix B to the Plan as:

“An ecosystem distinguished by old trees and related structural attributes. Old growth encompasses the later stages of stand development that typically differ from earlier stages in a variety of characteristics including tree size, accumulation of large dead woody material, number of canopy layers, species composition, and ecosystem function. Old growth is not necessarily virgin or primeval, it can develop over time following human disturbances, just as it does following natural disturbances. Old growth encompasses older forests dominated by early seral species, and forests in later successional stages dominated by shade tolerant species.” (USDA Forest Service 2004)

The Etowah River Watershed 6th level HU (hydrologic unit) has approximately 842 acres set aside for management under prescription 6.B, Areas Managed To Restore/Maintain Old Growth Characteristics. These areas comprise 6.5% of the HU and satisfy the Forest

Plan standard of maintaining 5% of each 6th level HUC in old growth or old growth compatible management (FW-044, Plan 2-17).

There are approximately 5.4% of the total acres in the project area (6th level HUC) that currently meet minimum old growth age that include forest communities in old growth types 5, 13, 21, 22, 24 and 25, as displayed in Table 17 (Objective 20.1, Plan 2-16). Within-stand diversity of the forest communities proposed for treatment is summarized in Table 18.

Table 17: Old Growth Community Types present in the Etowah HU, Meeting Minimum Age Criteria in 2007 and 2017

Old Growth Community Type	Code	Age Criteria - Minimum	Acres	
			2007	2017
Mixed/western mesophytic	5	140	164	540
River floodplain hardwood	13	100	198	226
Dry-mesic oak forest	21	130	71	138
Dry-xeric oak forest	22	110	163	544
Xeric pine & pine-oak forest	24	100	61	61
Dry and mesic oak-pine	25	120	35	48
Total Acres...			692	1,557
% of Etowah HU (12,895 acres)...			5.4	12.1

Table 18: Within-stand conditions in project treatment

Comp/Stand	Acres	Stand Condition	Forest Type	Treatment Proposed	Age Year	Basal Area ¹
571/27	43	Sparse sawtimber	Shortleaf pine/oak	Seedtree Cut and burn	1966	130
571/29	16	Sparse sawtimber	Shortleaf pine/oak	Seedtree Cut and burn	1966	130
571/31	49	Sparse sawtimber	Mixed oak/yellow pine	Seedtree Cut and burn	1966	130
571/25	42	Immature sawtimber	Bottomland hardwoods/yellow pine	Burn	1966	N/A ²
571/28	27	Immature pole timber	White oak – red oak – hickory	Burn	1974	N/A ²
571/32	19	Immature sawtimber	White pine	Burn	1966	N/A ²
571/34	12	Immature pole timber	White pine	Burn	1983	N/A ²
571/36	85	Immature pole timber	White oak – red oak – hickory	Burn	1966	N/A ²
566/19	91	Mature sawtimber	Virginia pine	Thin	1938	120-170
566/21	28	Low quality sawtimber	Shortleaf pine – oak	Thin	1909	120-170
567/1	38	Immature pole timber	Shortleaf pine	Thinning	1988	120-170
567/5	13	Immature sawtimber	Shortleaf pine	Thinning	1988	110-150
567/12	14	Immature pole timber	Loblolly pine	Thinning	1988	110-150
571/10	161	Immature sawtimber	White pine – upland hardwood	Thinning	1974	110-150
586/4	50	Immature sawtimber	Loblolly pine	Thinning	1980	110-150
586/13	37	Immature sawtimber	Loblolly pine	Thinning	1979	110-150
586/17	34	Immature sawtimber	Loblolly pine	Thinning	1978	110-150
586/40	6	Immature sawtimber	Loblolly pine	Thinning	1980	110-150
586/42	52	Immature sawtimber	Loblolly pine	Thinning	1980	110-150

¹ basal area is a measurement of the density of a forest community, expressed in square feet per acre.

² basal areas for these forest communities are not given because the stand is not to be treated with timber harvesting. See text for a discussion of the prescribed burning treatment in these stands.

Effects of the No Action Alternative

The No-Action Alternative would result in increased densities of trees over time. Basal area increases would be gradual along with random mortality of trees. SPB infestations, which occur on average of seven years, would continue to reduce Table Mountain, pitch, and shortleaf pines in the areas. In addition, the dense, young pine forest communities (including loblolly, shortleaf, and white pines) have an increasingly higher risk of partial or complete mortality due to SPB infestations. In cases of complete pine mortality, the forest community would convert to a sparse hardwood and hardwood - pine stand (Final EIS for the Forest Plan, page 3-405 to 3-409), composed of a variety of species, including red maple, white pine, hickories, sourwood, blackgum, scarlet oak, chestnut oak, flowering dogwood, sassafras, Virginia pine, and some black locust.

Under the No-Action Alternative, there would be little change in species diversity of trees and shrubs within the Etowah HU. Trees would become slightly taller each year and become increasingly vulnerable to wind events. White pine seedlings, saplings, and older trees would continue to slowly grow taller and occupy more growing space within the forest landscape.

Effects Common to Proposed Action and Action Alternatives

The Proposed Action (PA) and Alternatives 3 and 4 are similar in that they all implement portions of the actions in the PA.

Direct and Indirect Effects

Direct effects from the seedtree cut would include an immediate reduction in the density of trees, reducing the basal area from approximately 130 to 40 square feet per acre within Compartment 571, Stands 27, 29, and 31, and resulting in an increase in sunlight to the midstory and understory layers of the forest structure. Most large (greater than 5" diameters) Virginia pine and white pine would be removed in this action, along with lesser numbers amounts of other species. Indirect effects would include sprouting of damaged and severed stems in smaller diameter classes (less than approximately 12 inches). Species such as Virginia and white pine would not sprout back, but would germinate from the seed still viable in cones within the slash and present on and in the ground.

Within portions of Compartment 566, Stands 19 and 21 that are common to the PA and Alternatives 3 and 4, larger (greater than five inches) white pine and Virginia pine will be removed from these forest communities, along with lesser numbers of stems of other species, leaving species including chestnut oak, scarlet oak, black oak, shortleaf pine and white oak in the overstory. The midstory and understory would be composed of woody species including hickories, white pine, flowering dogwood, black gum, red maple, sourwood, and some scarlet oaks. Sunlight would increase immediately in the understory and midstory, causing the indirect effect of sprouting of most smaller diameter (less than

about 12 inches) hardwood species as well as young shortleaf and pitch pine (less than about 10 years), where present.

White pines would be girdled or cut down in Compartment 586, Stand 1, causing gaps in the canopy of the pines within an approximate two-acre area. Basal area of the white pine would be reduced from approximately 120 square feet per acre to 50 square feet, causing an immediate increase in sunlight to the midstory and understory. Rivercane would increase in growth, have limited expansion, and become denser.

Over the following 10-15 years, the existing white pine would become denser and the crowns of the trees would re-occupy growing space in the canopy, reducing sunlight to the understory cane. Other brush and tree species would also take advantage of the increased sunlight and compete successfully for the midstory growing space, further reducing the sunlight available to the cane.

Treatment of the nine young pine stands to be thinned for forest health (southern pine beetle (SPB) risk reduction) is the same for the PA and Alternatives 3 and 4. As detailed above, the immediate effect of the thinning to forest cover would be to increase sunlight to the understory and forest floor as well as increasing the available growing space for the remaining pine and hardwood trees. Indirect effects would include expansion of the crowns (leaves, limbs) of the residual trees, thereby increasing the amount of carbohydrates produced in each tree, and increasing the vigor and health of the trees. This treatment will reduce the overall risk of infestation by the SPB as well as other diseases and insect outbreaks (Forest Plan, Appendix F, pages F-32 to F-33).

Creation of early successional habitat within 100 feet of 34 wildlife openings will cause the immediate effect of increasing sunlight to the understory and the forest floor. In these stands, the basal area would be reduced to approximately 30 square feet per acre, and the remaining trees would be mostly oaks, hickories, black gum and some yellow pines. Indirectly, this action would cause a flush of sprouting from trees and herbaceous plants, and, over the subsequent 10-15 years, the area within 100 feet of the wildlife openings would become brushy, with woody (trees, shrubs) vegetation eventually dominating.

Road daylighting on Montgomery Creek, Hightower Creek, and Upper Nimblewill Roads will also create an immediate increase in sunlight to the midstory and understory, leading indirectly to the sprouting of most hardwoods and some pines, as discussed above. Larger oaks, hickories, black gum and yellow pines would be reserved in this action, resulting in a reduction to approximately 30 square feet per acre of basal area. This action would create a corridor of up to approximately 120 feet along 4.1 miles of roadway. Over the course of 10-15 years, this corridor would become increasing brushy, with woody stems increasing in frequency (number of stems per acre) and density (basal area, as measured in square feet per acre).

None of the stands where activities are proposed currently meet the minimum age criteria for their corresponding old growth community type. Therefore, none of the stands are

existing old growth (meeting all criteria) or potential old growth (meeting age criteria). Further old growth analysis is available in the project file.

Other activities (access/road management, soil and water improvement, and stream habitat enhancement) would have negligible effects on forest cover.

Effects Specific to Proposed Action and Alternatives

The PA is similar to Alternatives 3 and 4, except the PA does not prescribe additional treatments in Stands 19 and 21 (Compartment 566), which has led to a significant issue related to the control of Virginia and white pine over the following decade (see Significant Issue 1, page 12). In addition, other than a one-time burn, the Table Mountain pine restoration areas (Compartment 571) lack continued treatments for Table Mountain pine regeneration and establishment, which led to Significant Issue 2 (page 12).

Direct effects of the timber harvesting in both of these areas is discussed in the section above. The PA will treat more acres in Stands 19 and 21 of Compartment 566, increasing the area of direct effects described in the section above.

The PA and Alternative 3 include treatment with prescribed burning within both 566/19 & 21 and 571/27, 29 & 31. Burning is planned for the winter after the timber harvest, prior to the slash (limbs and stems left on site from timber harvest) curing (drying out), allowing for a relatively “cool” burn. This treatment would result in a direct effect of reductions in leaves and flashy fuels on the ground, reducing the duff (leaves and decaying material) in depth and top-killing trees with ground diameters up to approximately two-three inches. Increased sunlight would occur, some of it immediately and some of it after initial green-up in the spring.

Indirectly, this burn will result in prolific sprouting of existing hardwoods and some pines as discussed under Common Effects, and would also result in germination of seedlings of several species, including numerous hardwoods and some pines, including Table Mountain, pitch, and shortleaf (Waldrop, Mohr, and Brose, 2006). White pines may also be seen germinating from seed sources within and adjacent to the three thinned stands.

Under the PA and Alternative 3, the prescribed burn area for table mountain pine would include all or portions of Stands 25, 28, 32, 34, and 36 in Compartment 571. The prescribed burn in these areas would be largely a backing fire, causing direct effects similar to those of the stands that would have been thinned (Stands 27, 29 and 31), however the intensity of the fire would be less due to both the fuels present (no or little added slash from timber harvesting), position on the landform (mostly lower down off ridges), and the intentional ignition to create a backing (relatively cool) fire through most of these stands.

Under the PA, growth of sprouts along with germination and growth of other trees and shrubs would result in approximately 30,000 to 40,000 stems per acre after three years (based on research by Waldrop, et al., 2006). After six years, hardwood sprouts are

expected to reach 7-8 feet tall, overtopping Table Mountain pine seedlings that would be 4-5 feet tall (Waldrop, et al., 2006). Shrubs such as mountain laurel may also be equal or slightly shorter than the regenerating Table Mountain pine. Although Table Mountain pine trees would not be eliminated from the site, some mortality would take place over the 10-15 year period after the treatments, reducing the establishment of these pines in the developing cohort representing the future overstory.

Alternative 3 prescribes both burning and mechanized competition control in both areas (566/19 & 21 and 571/27, 29 & 31)(Significant Issues 1 and 2, page 12). This would allow flexibility in methods in order to obtain the desired conditions and meet Forest Plan objectives. If, in any treatment year, fuels are not adequate or weather conditions don't allow a prescribed burn, a mechanical treatment could be implemented to maintain or improve sunlight conditions for seedlings or saplings developing in the understory (Significant Issue 2). Mechanized competition control would extend the period of increased sunlight in the understory from either the timber harvest or a previous prescribed burn for approximately 3-5 years, allowing an indirect effect of continued vigorous growth of saplings, including Table Mountain (Significant Issue 2), pitch, and shortleaf pines as well as desired oaks and hickories. This type of treatment may reduce the overtopping by hardwoods experienced in other prescribed burn sites where no additional treatment was conducted (Waldrop, et al., 2006). Mechanized treatments would also reduce the competition from Virginia and white pines across the site, including residual as well as newly-germinated trees (Significant Issue 1, page 12).

Alternative 3 would prescribe burn all of Stands 1 and 13 in Compartment 566. As was discussed for the four stands in Compartment 571, the prescribed burn effects would be less intense because of generally lower amounts of fuel (no or little slash added from timber harvesting) and the intentional ignition to create a backing fire through most of these stands.

Alternative 4 would allow only mechanized equipment to control competition in the same two areas discussed above (566/19 & 21 and 571/27, 29 & 31)(Significant Issues 1 and 2). Direct and indirect effects are discussed above. Mechanical competition control would extend increased sunlight conditions in the understory and reduce the overall density of trees by removing trees not merchantable (less than 5 inches DBH) through the 10-15 year period. Stocking of Table Mountain, pitch, and shortleaf pine seedlings may or may not be present due to lack of sufficient heat (Table Mountain and pitch pines) or chance of poor seed production by shortleaf pine.

Table 19 is a comparison of the PA and alternatives, using predictive measures from the Significant Issues.

Table 19: Responses to Significant Issues using Predictive Measure (see Pages 12 & 13)

Significant Issue	Measure	Proposed Action	No Action	Alt 3	Alt 4
1. Competition control ¹ in 566/19, 21	Acres of treatment(s) ²	119	0	270 ³	216 ⁴
2. Establishment and competition control in 571/27, 29, 31	Acres of treatments ²	216	0	540 ³	432 ⁴

¹ Full issue description can be found on pages 12 & 13.

² Calculated by taking the maximum number of treatments possible over the next 15 years multiplied by the treatment acres. Significant Issue 1 used 119 treatment acres for the Proposed Action and 54 acres for Alternatives 3 and 4. Significant Issue 2 used 108 acres for the Proposed Action and Alternatives 3 and 4.

³ Based on five treatments over 15 years: Includes timber harvest, burn, and mechanical treatment in first four years, plus two more treatments (burn or mechanical) over the next 8-11 years.

⁴ Based on four treatments over 15 years: includes timber harvest and a mechanical treatment in first four years, plus two more mechanical treatments over the next 8-11 years.

Cumulative Effects

There have been no timber management activities in the Etowah River Sixth Order HU in the past 5-6 years. There may be some openings created by isolated blow down or undetected southern pine beetle infestations over the past 10 years, however the amounts in this particular area are negligible relative to the overall forest cover and age class diversity.

The cumulative effects of the No Action Alternative within the Etowah HU would be slight incremental increases in the dominance of species that thrive on undisturbed areas. The growing space of overstory species would slightly shift toward white pine and possibly sourwood and blackgum while the understory/midstory would shift slightly toward mountain laurel, sourwood, blackgum and flowering dogwood.

Table 20 displays the cumulative effects on approximate acres of age class across the HU for the Proposed Action and the alternatives, 10 years into the future from the 2007, assuming treatments are completed over the next decade. Age classes will change slightly, with a 0.6% rise (PA and Alternatives 3 and 4) in the early successional forest communities due to the road daylighting and timber harvesting surrounding the wildlife openings. Across the landscape, these early successional forest additions would add 13 small 1-4 acre young forest communities surrounding existing non-forested wildlife openings and three linear openings of 13-19 acres dissected by system roads. Under Alternatives 3 and 4, the 1-4 acre early successional forest communities surrounding 13 wildlife openings would be maintained in a early successional forest condition, perpetuating a slight effect on age class distribution within the Etowah HU.

Table 20: Cumulative Effects on Age Class Distribution of National Forest System Land in the Etowah River HU by 2017.

Age Range (years)	Proposed Action		Alt 1 – No Action		Alternative 2		Alternative 3	
	Acres	% of HU	Acres	% of HU	Acres	% of HU	Acres	% of HU
Non-forest	11	0	11	0	11	0	11	0
0-10	80 ¹	1	0	0	80 ¹	1	80 ¹	1
11-20	0	0	0	0	0	0	0	0
21-30	485	4	489	4	485	4	485	4
31-40	977	8	998	8	977	8	977	8
41-50	1,230	9	1,249	10	1,230	9	1,230	9
51-60	776	6	782	6	776	6	776	6
61-70	451	3	451	3	451	3	451	3
71-80	457	4	457	4	457	4	457	4
81-90	1,120	8	1,126	8	1,120	8	1,120	8
91-100	1,748	14	1,751	14	1,748	14	1,748	14
101-110	1,484	12	1,484	12	1,484	12	1,484	12
111-120	2,060	16	2,079	16	2,060	16	2,060	16
121-130	1,018	8	1,018	8	1,018	8	1,018	8
131-140	788	6	790	6	788	6	788	6
141-150	164	1	164	1	164	1	164	1
151-160	46	0	46	0	46	0	46	0
Totals...	12,895	100%	12,895	100%	12,895	100%	12,895	100%

¹Approximately 3 acres of early successional forest creation is outside of the Etowah HU.

3.2.2 Terrestrial Wildlife

Element - Management Indicator Species

Measure - Effects on populations and habitat conditions for individual MIS

Bounds of Analysis – Spatial: Habitat conditions in the approximately 13,000 acres comprising the Etowah River Sixth Level Hydrologic Unit. Temporal: Approximately 10-15 years following implementation.

Introduction

To help evaluate the effects of management practices on plants, animals, and fisheries, the Management Indicator Species (MIS) concept is used. Each MIS selected for the project represents many other species with similar habitat requirements. MIS have been selected because population changes to those species indicate the effects of management activities on the habitat.

The 2004 revised Forest Plan identifies 15 MIS for the Chattahoochee-Oconee National Forests. Of these, 10 occur within or near the Etowah River project area. These species were selected because they occur in this portion of the Forest and have populations or habitats that could directly or indirectly be affected by the project. 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 2004b). Populations trends for all of the current MIS are summarized in the September 2006 Management Indicator Species Population Trend Report for the Chattahoochee-Oconee National Forests (USDA Forest Service 2006). These Forest-wide trends are useful in putting the project-level effects into perspective.

Pine Warbler

Existing Conditions

The revised Forest Plan identified the pine warbler as a MIS to help indicate the effects of management on species associated with yellow 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 2007). The pine warbler is a common breeding bird on the Blue Ridge Ranger District and has been reported from Breeding Bird Surveys in the Etowah project area. Mid to late successional pine and pine-oak forest habitat are common on the project area and therefore, population levels of pine warblers likely are moderate.

Effects of Alternative 1 (No Action)

This alternative will perpetuate current conditions and no direct impacts to the pine warbler are expected. Through time, the amount of mature pine and pine-oak habitat will increase as the portions containing young forests mature. However, the dense pine plantations present on the project area will be susceptible to future attacks from southern pine beetle. In addition, in existing older yellow pine stands, the lack of prescribed burning will limit regeneration and these stands will be susceptible to encroachment from white pines and hardwoods. This may result in a decline in habitat conditions for the pine warbler and other species that utilize mature yellow pine forest habitats.

Effects Common to All Treatment Alternatives

The table mountain pine restoration activities common to all treatment alternatives include a seedtree cut of approximately 108 acres of mature, mixed yellow pine-oak stands. The species to be retained include table mountain pine, pitch pine, shortleaf pine, and selected oaks. All treatment alternatives also include the thinning of approximately 405 acres of the young pine plantations. Thinning of these stands will increase vigor in the remaining trees, increase their resistance to southern pine beetle attacks, and promote regeneration. As a result, the health of the existing pine stands should be improved and the abundance of this forest type should increase in the future. These activities will result in improved habitat conditions for the pine warbler and species that utilize mature pine forests.

To a lesser degree, the thinning to restore oak and oak-pine proposed near Two Run Creek will enhance the availability of mature shortleaf pine. The thinning will remove primarily white pine and Virginia pine. Mature oak and shortleaf pine will be retained and the opening of the stand will promote regeneration of these species. To a limited degree, these activities will enhance habitat conditions for pine warblers and associated species.

A small portion (less than 20 acres) of the stands to be harvested to create early successional forest habitat consist of young yellow pine stands. Given the abundance of mid to late successional pine and pine-oak forests in the project area, the creation of early successional forest habitat in these stands will have no impact on the availability of these habitats for pine warbler and associated species.

None of the other activities proposed will have any effect on habitat conditions for pine warbler or other species that utilize mature pine forests.

Effects Specific to Each Treatment Alternative

Alternative 2 (Proposed Action)

Under this alternative, the stands identified for table mountain pine restoration would be prescribed burned following the cutting activities. A one time prescribed burn of approximately 240 acres is proposed. The prescribed burning will help to control competing vegetation and to prepare a seed bed for the establishment of table mountain pine seedlings. The burning activities will have no direct effect on pine warblers or other associated species. However, these activities will result in an increase of abundance of this forest type in the future and in improved habitat conditions for the pine warbler and species that utilize mature pine forests.

Alternative 3

Under Alternative 3, both periodic prescribed burning and mechanical treatment of the competing vegetation is proposed for the stands identified for table mountain pine restoration. The combination of multiple prescribed burns and mechanical treatment will increase the probability of the successful establishment of table mountain pine seedlings as compared with prescribed burning or mechanical treatment alone. A similar

combination of fire and mechanical treatments are proposed for the oak and oak-pine restoration areas in this alternative. While a smaller acreage will be thinned as compared to Alternative 2, the addition of fire and mechanical treatments will help to control competing vegetation, especially white pine and Virginia pine.

While none of these activities will have any direct effect on pine warblers or other associated species, they will result in an increase of abundance of these forest types in the future and in improved habitat conditions for the pine warbler and species that utilize mature pine forests.

Alternative 4

Under this alternative, prescribed burning will not be utilized as part of the table mountain pine and oak oak/pine restoration activities. Control of competing vegetation will be by mechanical means only. The absence of prescribed burning may limit the successful establishment of table mountain pine and shortleaf pine seedlings. Both require a mineral seedbed for establishment and this is unlikely to occur from mechanical treatment alone. Therefore this alternative is less likely to result in an increase of abundance of these forest types in the future and any improvements in habitat conditions for the pine warbler and species that utilize mature pine forests will be much more limited.

Cumulative Effects

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, 2004b, 2006). There are no additional activities planned for the Etowah River 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.

Chestnut-sided Warbler

Existing Conditions

This species was selected as a MIS to help indicate the effects of management on species associated with high-elevation early successional forests. Chestnut-sided warblers are found in second-growth forests, overgrown fields, woodland edges, and in open, park-like woods (Hamel 1992). They are most common in suitable habitat over 3500 feet elevation, but occur sparingly down to 2000 feet and below. They are associated with dense vegetation in the form of shrubs and small trees about 3 feet above the ground that provides nesting sites and foraging areas (DeGraaf et al. 1991). Chestnut-sided warblers can be found in early successional habitats at higher elevations throughout the Forest. However, these types of habitat are limited on the Forest and have decreased due to a reduction in active forest management. Most of the Etowah River project area is less

than 2000 feet in elevation and existing early successional habitat is extremely limited. There are no stands less than 10 years of age in the project area. A small number of chestnut-sided warblers have been reported from Breeding Bird Surveys in the Etowah project area; however current chestnut-sided warbler populations in the project area likely are very low.

Effects of Alternative 1 (No Action)

This alternative will perpetuate current conditions and no direct impacts to the chestnut-sided warbler are expected. The relatively low elevation of the project area limits its suitability for chestnut-sided warbler. Through time, the small amount of existing early successional forest habitat will decline as the young forests mature. This may result in a decline in habitat conditions for the chestnut-sided warbler and other species that utilize high elevation early successional forest habitats.

Effects Common to All Treatment Alternatives

The daylighting activities proposed along selected road and around wildlife openings will increase the quantity of early successional forest habitat in the project area. The opening of the canopy will result in an increase in low growing grasses, forbs, and shrubs along the edge of the roads and wildlife openings. This will result in improved habitat conditions for a variety of early successional species. However, because of the relatively low elevation of the project area, the response of chestnut-sided warblers and other species associated with high elevation early successional habitats will be limited.

None of the other activities proposed will have any effect on habitat conditions for the chestnut-sided warbler or species that utilize high elevation early successional habitat.

Effects Specific to Each Treatment Alternative

Alternative 2 (Proposed Action)

Under this alternative, no maintenance activities of the early successional forest habitat created through the daylighting treatments are proposed. These areas would provide early successional forest habitat conditions for a period of approximately 10 years following the overstory removal. However through time as canopy closure is reached, the suitability of these areas to species such as chestnut-sided warbler would decline.

Alternative 3

In Alternative 3, the early successional forest habitat created by the overstory removal around the existing wildlife openings would be periodically maintained through the use of side-arm mowers, chainsaws or other mechanical means. This would allow for the perpetuation of early successional forest habitat conditions along the edge of the openings. These areas would remain suitable habitat for species such as chestnut-sided warblers and associated species for as long as the maintenance continues.

Alternative 4

The effects of this alternative on chestnut-sided warblers and associated species would be the same as Alternative 3.

Cumulative Effects

High-elevation early successional forest habitat used by the chestnut-sided warbler is limited on the Etowah River project area and the Forest as a whole. Bird survey data indicates that chestnut-sided warbler populations are relatively low on the Forest (USDA Forest Service 2004b, 2006). State-wide trends from Breeding Bird Survey Data (Sauer et al. 2005) suggest that chestnut-sided warbler populations have declined over the last 30 years. The revised Forest Plan has an objective to create and maintain a high elevation early successional component on the Forest, and chestnut-sided warbler populations are expected to increase through the implementation of the Plan (USDA Forest Service 2004a). There are no additional activities planned for the Etowah River project area that would affect the availability of high elevation early successional forests. Therefore no cumulative effects to chestnut-sided warblers or their habitat are expected.

Hooded Warbler

Existing Conditions

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. There are approximately 1600 acres of mature mesic deciduous forest on the project area which includes cove hardwood and cove-hardwood-yellow pine forest types. 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 2007). Mature forests with a structurally diverse understory and midstory layers are favored. The hooded warbler is a common breeding bird on the Blue Ridge Ranger District and has been reported from Breeding Bird Surveys in the Etowah River project area. Mature mesic deciduous forests are common on the project area and therefore, population levels of hooded warblers likely are moderate.

Effects of Alternative 1 (No Action)

This alternative will perpetuate current conditions and no direct impacts to the hooded warbler are expected. 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.

Effects Common to All Treatment Alternatives

There are no activities planned in the mature mesic deciduous forest stands in the project area. All cutting and prescribed burning activities will occur in the more xeric pine and upland hardwood stands. Therefore there will be no direct effects of any of the treatment alternatives on hooded warblers and other species associated with mature mesic deciduous forests. 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.

Effects Specific to Each Treatment Alternative

The effects of all treatment alternatives on hooded warblers will be the same.

Cumulative Effects

Mature mesic hardwood forests are common on the Etowah River project area and 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 and 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, 2004b, 2006). There are no additional activities planned for the Etowah River project 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.

Prairie Warbler

Existing Conditions

The revised Forest Plan identified the prairie warbler 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 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 Blue Ridge Ranger District and has been reported from Breeding Bird Surveys in the Etowah River project area. Prairie warbler populations likely are low on the project area due to the limited availability of early successional forest habitats.

Effects of Alternative 1 (No Action)

This alternative will perpetuate current conditions and no direct impacts to the prairie warbler are expected. Through time, the small amount of existing early successional forest habitat will decline as the young forests mature. This may result in a decline in habitat conditions for the prairie warblers and other species that utilize early successional forest habitats.

Effects Common to All Treatment Alternatives

The daylighting activities proposed along selected road and around wildlife openings will increase the quantity of early successional forest habitat in the project area. The opening

of the canopy will result in an increase in low growing grasses, forbs, and shrubs along the edge of the roads and wildlife openings. This will result in improved habitat conditions for a variety of early successional species. These activities should improve habitat conditions for prairie warblers and other species associated with early successional forest habitats.

None of the other activities proposed will have any effect on habitat conditions for the prairie warbler or species that utilize early successional forests.

Effects Specific to Each Treatment Alternative

Alternative 2 (Proposed Action)

Under this alternative, no maintenance activities of the early successional forest habitat created through the daylighting treatments are proposed. These areas would provide early successional forest habitat conditions for a period of approximately 10 years following the overstory removal. However through time as canopy closure is reached, the suitability of these areas to species such as prairie warbler would decline.

Alternative 3

In Alternative 3, the early successional forest habitat created by the overstory removal around the existing wildlife openings would be periodically maintained through the use of side-arm mowers, chainsaws or other mechanical means. This would allow for the perpetuation of early successional forest habitat conditions along the edge of the openings. These areas would remain suitable habitat for species such as prairie warblers for as long as the maintenance continues.

Alternative 4

The effects of this alternative on prairie warblers and associated species would be the same as Alternative 3.

Cumulative Effects

Early successional forest habitats are limited on the Etowah River project 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 forest 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 2004b, 2006). 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 Etowah River 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.

Ovenbird

Existing Conditions

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 Blue Ridge Ranger District and has been reported from Breeding Bird Surveys in the Etowah River project area. The majority of the Etowah River project area consists of large contiguous blocks of mature hardwood forests. Given the availability of interior forest habitat, population levels likely are moderate.

Effects of Alternative 1 (No Action)

This alternative will perpetuate current conditions and no direct impacts to ovenbird are expected. 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.

Effects Common to All Treatment Alternatives

None of the cutting proposed for the table mountain pine restoration, oak and oak-pine restoration, canebrake and southern pine beetle prevention will substantially impact the availability of interior forest habitat. The treatment of these 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, the prescribed burning, road management, soil and water improvement and stream habitat enhancement will not result in appreciable changes to interior forest conditions.

More substantial canopy opening will occur as a result of the daylighting proposed along selected road and around wildlife openings. In these sites, the majority of the overstory will be removed. However, since the opening created will be relatively narrow (<200 feet) and will be confined along existing openings (roads and food plots), the impacts to interior forest habitat will be minimal. As a result, habitat conditions and populations of interior forest species such as the ovenbird will be maintained.

Effects Specific to Each Treatment Alternative

The effects of all treatment alternatives on ovenbirds will be the same.

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. Interior forest habitats are abundant on the Etowah River project area as well as 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 2004b, 2006). 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 Etowah River project area that would affect the availability of interior forests. Therefore no cumulative effects to interior forest habitat and associated species such as ovenbird are expected.

Acadian Flycatcher

Existing Conditions

The revised Forest Plan identified the Acadian Flycatcher as the MIS to represent Mid to 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 Etowah River project area. However, the limited number of points surveyed in the project area were from upland areas. The Acadian flycatcher is a common breeding bird on the Blue Ridge Ranger District and given the abundance of mature riparian habitat in the project area, population levels likely are moderate.

Effects of Alternative 1 (No Action)

This alternative will perpetuate current conditions and no direct impacts to Acadian Flycatcher are expected. Through time, the amount of mid to 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.

Effects Common to All Treatment Alternatives

The cutting, prescribed burning, daylighting, road management, soil and water improvements, and stream enhancement have the potential to impact riparian habitat conditions. However, application of riparian corridor standards (MRx 11) and Best Management Practices (BMP's) 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 and fireline construction. Major ground disturbing activities such as road construction (except at designated crossings) log landings and bladed firelines are prohibited in the riparian corridor. 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. BMP's provide for the retention of a minimum of 50 square feet of basal area of canopy trees within the stream management zone. The majority of the cutting treatments proposed will occur in drier upland sites where pines

dominate. The riparian corridors dominated by hardwood within these pine stands will not be thinned. As a result of these measures, riparian habitat conditions and populations of associated species such as the Acadian Flycatcher will be maintained.

Effects Specific to Each Treatment Alternative

The effects of all treatment alternatives on Acadian Flycatchers will be the same.

Cumulative Effects

Mid to 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, 2004b, 2006). There are no activities planned for the Etowah River project 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.

Scarlet Tanager

Existing Conditions

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 2007). Over half of the Etowah River area consists of mature upland hardwood forests. The scarlet tanager is a common breeding bird on the Blue Ridge Ranger District and has been reported from Breeding Bird Surveys in the Etowah River project area. Given the availability of mature upland oak forest habitat, population levels likely are moderate.

Effects of Alternative 1 (No Action)

This alternative will perpetuate current conditions and no direct impacts to scarlet tanagers are expected. Through time, the amount of mature upland oak forests will increase as the Forest matures. This should result in improved habitat conditions for the scarlet tanager and other species that utilize mature upland hardwood forests.

Effects Common to All Treatment Alternatives

The proposed table mountain pine and oak and oak pine restoration and Southern Pine beetle prevention activities will occur in pine-dominated stands and will not affect the current availability of mature upland oak forests. Through time, the oak and oak pine restoration activities will increase the availability of these habitats and will result in improved habitat conditions for the scarlet tanager and other species that utilize mature, upland oak habitats.

Approximately 60 acres of the stands to be harvested to create early successional forest habitat consist of mature upland hardwoods. The cutting treatments proposed in these stands will reduce their suitability to scarlet tanagers. However, mature oak stands are abundant on the project area and the 60 acres represents less than 1 % of the available habitat in the project area. Given the abundance of mid to late successional oak forests in the project area, the creation of early successional forest habitat in these stands will have no impact on the availability of these habitats for scarlet tanager and associated species.

None of the other activities proposed will have any effect on habitat conditions for scarlet tanager or other species that utilize mature upland oak forests.

Effects Specific to Each Treatment Alternative

Alternative 2 (Proposed Action)

Under this alternative, approximately 119 acres will be thinned in the Two Run Creek area for oak and oak pine restoration. The stands currently are dominated by pine. The Virginia and white pine in these stands will be removed retaining the oak and shortleaf pine. Through time, this will increase the availability of oak forests and will result in improved habitat conditions for the scarlet tanager and other species that utilize mature, upland oak habitats. However since no follow up treatments such as prescribed burning or mechanical treatment are proposed, competition from white pine and Virginia pine seedlings may limit the success of the restoration.

Alternative 3

Under this alternative combination of fire and mechanical treatments are proposed for the oak and oak-pine restoration areas. While a smaller acreage will be thinned as compared to Alternative 2, the addition of fire and mechanical treatments will help to control competing vegetation, especially white pine and Virginia pine.

While none of these activities will have any direct effect on scarlet tanager or other associated species, they will result in an increase of abundance of oak forest types in the future and in improved habitat conditions for the scarlet tanager and species that utilize mature upland hardwood forests.

Alternative 4

The effects of this alternative on scarlet tanager and species utilizing mature upland hardwood forest will be the same as Alternative 3.

Cumulative Effects

Mature oak forests are abundant on the Etowah River 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 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, 2004b, 2006).

There are no additional activities planned for the Etowah River 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.

Pileated Woodpecker

Existing Conditions

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. Approximately 67% of the Etowah River project area is greater than 60 years-of-age and 57 % is in late successional conditions (greater than 80 years-of-age). The pileated woodpecker is a common breeding bird on the Blue Ridge Ranger District and has been reported from Breeding Bird Surveys in the Etowah River project area. Given the availability of mid to late successional forest habitat, population levels likely are moderate.

Effects of Alternative 1 (No Action)

This alternative will perpetuate current conditions and no direct impacts to pileated woodpeckers are expected. Through time, the amount of older forests will increase as the Forest matures as will the availability of dens and snags. This should result in improved habitat conditions for the pileated woodpecker and other species that utilize dens and snags.

Effects Common to All Treatment Alternatives

The cutting, prescribed burning and daylighting activities 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 timber harvest activities.

The proposed canebrake restoration activities will include girdling of white pines along the edge of the existing canebrake to allow its expansion. The girdled trees will die and provide an additional supply of snags for pileated woodpecker and other snag dependent species. The availability of downed wood will increase as these snags deteriorate and fall.

The prescribed fire treatments proposed in this alternative 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 small portion of the project area will be prescribed burned.

None of the other activities proposed will have any effect on habitat conditions for pileated woodpecker or other species that utilize snag habitat.

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. Through time, the amount of mid to 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.

Effects Specific to Each Treatment Alternative

The effects of all treatment alternatives on pileated woodpeckers will be the same.

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, 2004b, 2006). There are no additional activities planned for the Etowah River 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.

White-tailed Deer

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 (USDA Forest Service 2004a).

A portion of the Etowah River project area is within the Blue Ridge Wildlife Management Area (WMA) which is managed cooperatively with Georgia Department of Natural Resources (DNR). Georgia DNR personnel maintain approximately 160 acres of high quality permanent openings in the WMA that benefit deer as well as other game species and a wide variety of nongame species. Additional permanent openings outside of the WMA are maintained by USFS personnel. Mature mast-producing stands also are abundant in the Etowah River project area. However, early successional forest habitat is

extremely limited and as a result current deer populations are moderate on the Etowah River project area.

Effects of Alternative 1 (No Action)

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

Effects Common to All Treatment Alternatives

A number of the treatments proposed will result in improved habitat conditions for deer. The canopy openings resulting from the proposed cutting 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 early successional forest habitat creation proposed also will result in improved habitat conditions for deer. There currently are no stands less than 10 years of age in the project area. The daylighting of selected roads and wildlife openings will provide this much needed habitat component. In addition, the daylighting around the wildlife openings will reduce the shading and root competition within the openings, enhancing the productivity of clover or other planted forages.

Approximately 60 acres of the stands to be harvested to create early successional forest habitat consist of mature upland hardwoods. The thinning treatments proposed in these stands will reduce mast production in these stands. This will be somewhat offset by increased production by the residual trees as their crowns expand. In addition, mature oak stands are abundant on the project area and the 60 acres represents less than 1 % of the available habitat. Given the abundance of mid to late successional oak forests in the project area, the creation of early successional forest habitat in these stands will have no impact on the availability of hard mast for deer and other mast dependent species. Through time, the amount of mid to 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.

Effects Specific to Each Treatment Alternative

Alternative 2 (Proposed Action)

Under this alternative, no maintenance activities are proposed for the early successional forest habitat created through the daylighting treatments. These areas would provide early successional forest habitat conditions for a period of approximately 10 years following the overstory removal. However, through time as canopy closure is reached, browse and soft mast production would decline, limiting the benefit of these areas to deer and other species using early successional forest habitats.

Alternative 3

In this alternative, periodic prescribed burning is proposed for both the table mountain pine and oak and oak-pine restoration areas. These burns will stimulate the production of new growth of both herbaceous and woody species for 3-4 years following the burns.

The early successional forest habitat created by the overstory removal around the existing wildlife openings would be periodically maintained through the use of side-arm mowers, chainsaws or other mechanical means. This would allow for the perpetuation of early successional forest habitat conditions along the edge of the openings. These areas would continue to provide a source of browse and soft mast for deer and other species for as long as the maintenance continues. In addition, these maintenance activities will enhance the productivity of clover or other planted forages by minimizing the shading and root competition within the openings.

Alternative 4

In this alternative, only mechanical treatments are proposed to control competing vegetation in the table mountain pine and oak and oak-pine restoration areas. Prescribed burning will not be used and as a result, the increase in herbaceous and woody forages used by deer will be more limited in these stands than in the other treatment alternatives. As in alternative 3, the early successional forest habitat created around the wildlife openings will be maintained, prolonging their benefit to deer and other species using early successional forest habitats.

Cumulative Effects

Early successional forest habitat and high quality permanent openings important for deer are common in the Etowah River project area. 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 2006). 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). No additional activities affecting deer habitat are planned for the Etowah River area. Therefore no cumulative effects to white-tailed deer or their habitat are expected.

Black Bear

Existing Conditions

This species was selected as a MIS to help indicate the effects of management in meeting public demand as a hunted species. In the Southern Appalachians, important habitat elements for black bears are habitat diversity, den site availability, availability of hard mast, and habitat remoteness (USDA Forest Service 2004a)

Early successional forest habitat is extremely limited in the project area and as result, soft mast is uncommon. However, mature mast-producing stands are abundant in the Etowah River project area. In addition, over half of the project area is in late successional

conditions (greater than 80 years-of-age) and as a result, large den trees are common. Bears also utilize planted forages from food plots, especially in the early spring. High quality food plots are abundant on the portion of the project area in the Blue Ridge WMA. Current bear populations are moderate in the project area.

Effects of Alternative 1 (No Action)

This alternative will perpetuate current conditions and no direct impacts to black bear are expected. Through time, the limited amount of available early successional forest habitat in the Etowah River project area will decline as the forests in the area mature. This should result in a further reduction of the availability of soft mast important to bears and many other species. However, the amount of mature upland hardwood forests will increase as the Forest matures resulting in increases in hard mast and den tree availability.

Effects Common to All Treatment Alternatives

A number of the treatments proposed will result in improved habitat conditions for black bear. The canopy openings resulting from the proposed cutting activities will increase the production of soft mast and herbaceous foods in these stands. Similarly, prescribed burning also will stimulate the production of new growth of both herbaceous and woody species.

The early successional forest habitat creation proposed also will result in improved habitat conditions for black bears. There currently are no stands less than 10 years of age in the project area. The daylighting of selected roads and wildlife openings will provide this much needed habitat component. In addition, the daylighting around the wildlife openings will reduce the shading and root competition within the openings, enhancing the productivity of clover or other planted forages.

Approximately 60 acres of the stands to be harvested to create early successional forest habitat consist of mature upland hardwoods. The thinning treatments proposed in these stands will reduce mast production in these stands. This will be somewhat offset by increased production by the residual trees as their crowns expand. In addition, mature oak stands are abundant on the project area and the 60 acres represents less than 1 % of the available habitat. Given the abundance of mid to late successional oak forests in the project area, the creation of early successional forest habitat in these stands will have no impact on the availability of hard mast for bears and other mast dependent species. Through time, the amount of mid to late successional oak forests will increase as the forests in the area mature. This should result in increased hard mast production and den tree availability in the area, which will benefit bears and other mast-dependent species.

Effects Specific to Each Treatment Alternative

Alternative 2 (Proposed Action)

Under this alternative, no maintenance activities of the early successional forest habitat created through the daylighting treatments are proposed. These areas would provide

early successional forest habitat conditions for a period of approximately 10 years following the overstory removal. However, through time as canopy closure is reached, soft mast and herbaceous food production would decline, limiting the benefit of these areas to bears and other species using early successional forest habitats.

Alternative 3

In this alternative, periodic prescribed burning is proposed for both the table mountain pine and oak and oak-pine restoration areas. These burns will stimulate the production of new growth of both herbaceous and woody species for 3-4 years following the burns.

The early successional forest habitat created by the overstory removal around the existing wildlife openings would be periodically maintained through the use of side-arm mowers, chainsaws or other mechanical means. This would allow for the perpetuation of early successional forest habitat conditions along the edge of the openings. These areas would continue to provide a source of soft mast and herbaceous foods for bears and other species for as long as the maintenance continues. In addition, these maintenance activities will enhance the productivity of clover or other planted forages by minimizing the shading and root competition within the openings.

Alternative 4

In this alternative, only mechanical treatments are proposed to control competing vegetation in the table mountain pine and oak and oak-pine restoration areas. Prescribed burning will not be used and as a result, the increase in soft mast and herbaceous forages used by bears will be more limited in these stands than in the other treatment alternatives. As in alternative 3, the forest successional habitat created around the wildlife openings will be maintained, prolonging their benefit to bears and other species using early successional forest habitats.

Cumulative Effects

Black bear numbers have increased and are beginning to stabilize after 20 years of growth, according to bait station survey results (USDA Forest Service 2006). Based on harvest records and bear and human encounters, state biologists have concluded that bears are nearing carrying capacity on the Chattahoochee NF. Increased acres of older hardwood stands, sustained hard mast production, and enhanced soft mast production through forest management activities—such as prescribed burning and timber harvest—have contributed to improved black bear habitat on the Forest.

Mature hard mast producing stands that are important to bears are common on the Etowah River project area as well as the Forest as a whole. However, early successional forest that are important sources of soft mast are much more limited across the Forest. Implementation of the revised Forest Plan is expected to provide a diversity of habitats that will benefit black bear populations on the Forest (USDA Forest Service 2004a).

No additional activities affecting bear habitats are planned the project area. Therefore no cumulative effects to black bear or their habitat are expected.

Table 21 below summarizes the effects of the alternatives on the Management Indicator Species.

Table 21: Effects of Alternatives on Project Management Indicator Species

Management Indicator Species	Alt 1	Alt 2	Alt 3	Alt 4
Pine Warbler	M	M	M	M
Chestnut-sided Warbler	M	I	I	I
Hooded Warbler	M	M	M	M
Prairie Warbler	M	I	I	I
Ovenbird	M	M	M	M
Acadian Flycatcher	M	M	M	M
Scarlet Tanager	M	M	M	M
Pileated Woodpecker	M	M	M	M
White-tailed Deer	M	I	I	I
Black Bear	M	I	I	I

I=Increase Habitat Capability, D=Decrease Habitat Capability, M=Maintain Habitat Capability.

3.2.3 Aquatic Resources

Element - Aquatic Habitats Including Threatened, Endangered, Sensitive and Locally Rare Aquatic Species

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

Bounds of Analysis – Spatial: Habitat Conditions in the streams in and immediately down stream of the stands where project activities are proposed. Temporal: Approximately 10-15 years following implementation.

Existing Conditions

The major perennial streams in the project area are the Etowah River and Montgomery Creek. Smaller tributary streams include Edmunston Creek, Two Run Creek, Black Branch and Dunn Branch. Several of the streams in the project area were surveyed by USFS, Georgia DNR, and Conservation Fisheries Inc. personnel in July 2007 (project folder).

Lower portions of the Etowah River between the Hightower Church road crossing (Hightower Bridge) and the FS road 28-1 crossing (“Montgomery Creek” Bridge) contain a diverse fish assemblage including Alabama, tricolor, and yellowfin shiners, bluehead and creek chubs, stonerollers, Alabama hogsuckers, banded sculpins, and several darters including Bronze darter (Locally Rare species), Holiday darter (Sensitive species) and Etowah darter (Endangered species). Etowah darters were not previously know to occur

upstream of Hightower bridge. A similar species assemblage was found upstream at the FS road 28-1 crossing with a few exceptions. In addition to the species listed above, rainbow trout, black redhorse, and bridled darters also were found at the FS 28-2 crossing while the Etowah darter was absent. The Etowah River also was sampled further upstream at the confluence with Montgomery Creek. A much simpler fish assemblage was found there that included stonerollers, yellowfin shiners, creek chubs, Alabama hogsuckers, banded sculpin, and brown and rainbow trout. In the headwater portion of the Etowah River above Camp Frank B. Merrill where stream habitat improvement structures are proposed, only rainbow trout were found.

The lower portion of Montgomery Creek, just upstream of its confluence with the Etowah River contains creek and bluehead chubs, yellowfin shiners, banded sculpins, bronze darters, and rainbow trout. Further upstream near the FS road 141 crossing where stream structures are proposed, only rainbow trout, brown trout and chubs were found.

The smaller streams in the project area contain much simpler fish assemblages. Two Run Creek was found to contain only bluehead chubs, creek chubs, and yellowfin shiners. The unnamed tributary to the Etowah River in Compartment 571 stand 10 contained only banded sculpins.

Effects to federally-listed threatened and endangered, and Regional Forester Sensitive Aquatic 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, 1 federally listed and 5 Sensitive Aquatics Species occur or potentially occur in the vicinity of the project (Table 22). In addition, 2 other aquatic 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 Forest Service aquatic 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 Lumpkin County, (5) ongoing discussions with GNHP, Forest Service, and other agency biologists, (6) various scientific references such as technical manuals, NatureServe information, and others, and (7) results from project-level surveys.

Table 22: PETS and Locally Rare Aquatic Species known to occur or with potential to occur in the Etowah River project vicinity.

Scientific Name	Common Name	Status
<i>Etheostoma etowahae</i>	Etowah Darter	E
<i>Macromia margarita</i>	Margarita River Skimmer	S
<i>Ophiogomphus incurvatus</i>	Appalachian Snaketail	S
<i>Ophiogomphus edmundo</i>	Edmunds Snaketail	S
<i>Beloneuria georgiana</i>	Georgia Beloneurian Stonefly	S
<i>Etheostoma brevirostrum</i>	Holiday Darter	S

<i>Percina palmaris</i>	Bronze Darter	LR
<i>Percina</i> <i>sp.cf.macrocephala</i>	Muscadine Darter	LR

The only known Federally listed aquatic species in the project area is the Etowah Darter (*Etheostoma etowahae*). This species is endemic to the upper Etowah River system in north Georgia, where it is restricted to the upper Etowah mainstem and two tributaries, Long Swamp and Amicalola Creeks (Smith 1993). It lives in warm and cool, medium and large creek or small rivers, approximately 15 to 30 meters in width, and of moderate or high gradient with rocky bottoms (Burkhead 1993). It is found in relatively shallow riffles, with large gravel, cobble, and small boulder substrates. The sites having the greatest abundance of this species have clear water and relatively little silt in the riffles. The Etowah Darter has been found in the Etowah River, downstream of the Hightower Bridge (Freeman and Wenger 2000, B. Freeman, pers. comm). Current surveys for this project found Etowah Darters approximately 1.75 miles upstream of Hightower Bridge (project folder). It has not been found in previous or current surveys of the Etowah River or its tributaries upstream of the FS 28-1 crossing (“Montgomery Creek” Bridge) (Freeman 1994, Freeman and Wenger 2000).

Sensitive and locally rare aquatic species known from the Etowah River Project area include the holiday darter (*Etheostoma brevirostrum*), bronze darter (*Percina palmaris*) and muscadine darter (*Percina sp.cf.macrocephala*). 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*).

Effects of Alternative 1 (No Action):

This alternative will perpetuate current conditions in the streams in the project area. Routine road maintenance activities would continue but more extensive road maintenance proposed would not occur. Where problems exist, these roads would continue to be a chronic source of sediment. Similarly, the road proposed for closure and revegetation would remain open and would continue to provide a sediment source to adjacent streams. Through time, runoff from these sources could degrade the aquatic habitat in the project area.

Effects Common to All Treatment Alternatives

The cutting, prescribed burning, firebreak construction, road management, and stream habitat enhancement work 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 timber cutting 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 riparian corridor 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.

Proposed road management activities include culvert replacement, repair of road drainage structures, and spot surfacing with gravel on FS roads 880 (Two Run Branch), FS 141 (Montgomery Creek), and FS98 (Dunn Branch). Proposed soil and water improvement activities include the closure and revegetation of the old road near Pierce Cemetery Road. These activities will result in improved water quality and aquatic habitat by reducing sediment input to streams in the project area.

Stream habitat improvement is proposed for headwater sections of the Etowah River and Montgomery Creek. Both sections are relatively flat and shallow, with limited cover and pool habitat. These sections also contain very low fish diversity and are dominated by rainbow and/or brown trout. The proposed stream habitat improvement work is designed to improve habitat conditions by deepening pools, constricting the channel to flush sediments and provide clean gravel substrate, providing overhead cover, and stabilizing stream banks to prevent further erosion. Completion of these structures will enhance habitat conditions for rainbow and brown trout in these headwater streams.

The structures will be installed with hand labor. No mechanized equipment (bulldozers, track hoes, farm tractors) will be used. The structures will be constructed of native logs and rocks. Streambank trees will not be cut. Minor disturbance to streambank will be required to anchor these structures in place. However, streambank disturbance will be mitigated by seeding and mulching exposed soils using native plants or non-persistent, non-native species. Instream disturbance will be minor and short term. During the construction activities, stream bottom substrates will be disturbed, resulting in a temporary clouding of the water in the immediate area of the work. Any sediment disturbed will quickly dissipate downstream and there will be no downstream impacts from these activities.

Effects Specific to Each Treatment Alternative

Alternative 2: (Proposed Action)

In this alternative, the area proposed for oak and oak pine restoration will include both sides of Two Run Creek. This will require the construction of one stream crossing on Two Run Creek to access the east side of the area. This will result in a temporary disturbance to the stream and streambank during the construction of the crossing. However, water quality and aquatic habitat will be protected by the delineation of the

implementation of the standards in the Forest Plan and BMP's. The crossing will be aligned at a right angle to the stream to minimize the length of stream disturbance and located to minimize the amount of fill needed and minimize channel impacts (Standard 11-037). There should be no impacts to aquatic species from this alternative.

Alternative 3

In this alternative, the oak and oak pine restoration activities will occur only on the west side of the Two Run Creek road (FS 880). As a result, no new stream crossings will be required and there will be no disturbance to the stream or streambanks of Two Run Creek. However, this alternative does propose to prescribe burn the portion of the area to the west of Two Run Creek road to promote the regeneration of shortleaf pine and control competing vegetation. This will require additional ground disturbance to establish control lines. The majority of the control lines will be on the upper slopes and ridge to the west of Two Run Creek, outside of the riparian corridor. Two Run Creek road will form the eastern control line. No fireline construction will occur in between the road and Two Run Creek. As a result, there will be no adverse effects to water quality or aquatic habitat from the prescribed burning activities.

Alternative 4

As in alternative 3, the oak and oak pine restoration activities will occur only on the west side of Two Run Creek road and no new stream crossings will be required. In this alternative, the control of competing in both the table mountain and oak and oak pine restoration areas will be by mechanical equipment only. No prescribed burning will be conducted, eliminating the ground disturbances associated with control line establishment. The work will involve the use of chainsaws to remove competing vegetation. There will be no impacts to water quality or aquatic habitat from these activities.

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). Forest-wide water quality standards, Riparian Corridor (MRx 11) standards, as well as guidelines from the Manual for Erosion and Sediment Control in Georgia (Georgia Soil and Water Conserv. Comm. 2000) and Georgia's Best Management Practices for Forestry (Georgia Forestry Comm. 1999) will be followed in this and all future projects on the Forest where appropriate to maintain water quality and prevent adverse impacts to aquatic species. In addition, ongoing and future watershed improvement projects throughout the Forest will be designed and implemented to reduce existing water quality impacts.

There are several ongoing and recently completed activities on Camp Frank B. Merrill. Recently completed projects within the camp include: 1) Construction of a C-130 & C-17 Mock-Up Trainer and demolition of 3 existing training structures located in a maintained grassy area adjacent to the airfield, 2) Construction of a general storage building in the lower ropes training area in a maintained grassy area adjacent to the latrine building, 3)

Construction of an administrative/medic building in an existing gravel parking lot and demolition of existing building #23 and #70, 4) Paving of portions of 2 existing gravel roads and 2 parking areas, and construction of an overhead cover for the existing 25 meter firing range located adjacent to the airfield. These sites are located in upland areas, well away from any watercourses and sufficient vegetative buffer existed between all of the sites and existing streams. Appropriate erosion control measures including installation and maintenance of silt fences and prompt revegetation of all exposed soils were utilized on these projects. As a result, there were no adverse water quality effects from these previous construction projects on Camp Merrill.

Ongoing activities include the demolition of Building 49 in the lower ropes training area, demolition of former water plant, and removal of guard shack at the ammunition depot. Several of these buildings are located immediately adjacent to the Etowah River. However these projects were designed to minimize water quality impacts and to protect the aquatic resources. Best Management Practices (BMP's) will be followed during all construction activities. Erosion control measures such as the establishment of a double row of Type-C silt fence will be installed prior to any ground disturbance. Disturbed sites will be promptly revegetated upon completion of the work. Silt fences will be maintained until vegetation has been established on the sites. As a result, there will be no adverse impacts to water quality or aquatic habitat from these projects.

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.

There are no additional activities planned for the Etowah River project area that would affect the aquatic habitat conditions and therefore no cumulative effects are expected.

3.2.4 Terrestrial Threatened and Endangered and Forest Concern Species

Element - Threatened and Endangered and Forest Concern Species

Measure - Effects on populations and habitat conditions for individual species

Bounds of Analysis – Spatial: Habitat conditions in the project area. Temporal: Approximately 10-15 years following implementation.

Existing Conditions

Site-specific inventories for federally listed, Regional Forester sensitive, and locally rare plants were conducted by Tom Govus, botanical contractor, in May and June, 2007, and by Cindy Wentworth, Forest Service botanist, in June and July, 2007. In addition, non-native invasive species (NNIS) were recorded. The majority of NNIS were located along road edges and consisted of Japanese stiltgrass (*Microstegium vimineum*), sericea lespedeza (*Lespedeza cuneata*), and autumn olive (*Eleagnus umbellata*). Some of the wildlife openings contained large populations of sericea. Japanese stiltgrass was found in a few shady, streamside sites, in addition to road edges.

Effects to federally listed threatened and endangered species are analyzed in detail in the Biological Evaluation for this project. Results are summarized here.

Small-whorled pogonia – Based on site-specific inventories, the only federally listed species that occurs in the project area is a federally listed orchid, the small-whorled pogonia (*Isotria medeoloides*). One small population of this species, consisting of 5 individuals, was found by Tom Govus while conducting plant inventories for the proposed project. The plants occur in an area consisting primarily of hardwoods with some scattered white pine in the midstory and a filtered (i.e. partly shady) light regime.

According to the Forest Plan (2004), sixteen populations of the pogonia are known from the Chattahoochee. Populations range in size from 1 plant to approximately 50 individuals. According to the Recovery Plan (USFWS 1992), the plant is found primarily in second and third-growth deciduous and mixed-pine hardwoods. Ages of older trees in orchid sites across the region, vary from approximately 30 years in South Carolina to 80 years in Virginia. Habitat is highly variable, but is generally mesic with an open understory, often with old logging roads and streams nearby. The plant appears to be a mid-successional species, and declines appear to be related to succession of the surrounding forest. Many of the populations are so small, they may not be self-sustaining regardless of habitat conditions.

Federally listed species are directly protected in the Forest Plan (2004) through Goal 15, Objective 15.1, and forest-wide standards FW-029 through FW-032. Standards FW-031 and FW-032 address threats to federally listed species from NNIS. NNIS found in the same stand as the pogonia during inventories were Japanese stiltgrass (*Microstegium*

vimineum), autumn olive (*Eleagnus umbellata*), and sericea lespedeza (*Lespedeza cuneata*).

The stiltgrass is an annual that reproduces by seeds. These seeds are spread primarily by flood waters, but also by animals, humans, and contaminated soil, and possibly by wind for short distances, only. It spreads quickly in sites with natural or human-mediated soil disturbance, and seeds can remain viable in the soil for 3 to 5 years (Evans et al., 2006 NatureServe 2007). Autumn olive also reproduces primarily by seed which is spread by birds and small mammals. It appears to be a problem primarily where it has been planted and then spreads to adjacent sites (NatureServe 2007). Sericea lespedeza is an excellent plant for erosion control, and in the past has been used for that purpose. However, it is an aggressive NNIS, affecting plant diversity by forming dense stands in disturbed, open areas (NatureServe 2007). It can sprout from root crowns and by seeds dispersed by animals and humans (Evans et al 2006). These three species occurred scattered along a road running through the stand where the orchid was found. The road is approximately ¼ mile from the small-whorled pogonias, with several drains and ridges occurring between the road and the plants.

Habitats for Japanese stiltgrass, autumn olive and sericea lespedeza occur throughout the proposed project area. The site in and around the pogonia does not provide the high light and disturbed soil conditions preferred by the autumn olive and sericea (Evans et al 2006, Miller 2003, TNC 2002). Evans et al (2006) list the primary habitat for *Microstegium* as ditches, floodplains and wetlands, forest and stream edges, as well as shaded roads and trails. The habitat where the small-whorled pogonias were found is described as occurring in the upper end of a cove, with a dry to mesic moisture regime and filtered sunlight (Govus, per. commun.). Although the habitat conditions in the pogonia site could support the *Microstegium*, the habitat is not optimal for the invasive species. *Microstegium* was not found in the pogonia site.

Effects of Alternative 1 (No Action)

This alternative will perpetuate current conditions and no direct impacts to the small whorled pogonia will occur. As vegetative succession takes place in the stand, the pogonia could possibly decline, as it has been noted in South Carolina and in Georgia that understory and midstory vegetation may shade plants, causing a decline in individual colonies (Forest Plan 2004). As discussed above, the site in and around the pogonia does not provide the high light and disturbed soil conditions preferred by the autumn olive and sericea, nor does it fit the description of primary habitat for Japanese stiltgrass (Evans et al 2006, Miller 2003). The no action alternative would not cause a change in conditions that would favor these invasives. The grass is not currently present in or near the 5 orchids, and is slow to invade undisturbed sites (NatureServe 2007). Although there is no way to predict whether or not it might become established, 15 years of observations of other pogonia sites with similar habitat on the Chattahoochee National Forest have not noted Japanese stiltgrass to be a problem.

Effects Common to all Treatment Alternatives

As discussed above, objectives and standards found in the Forest Plan completely protect small-whorled pogonia from any adverse effects due to forest management. To protect the plants, cutting of trees and any associated ground disturbance will not occur in the vicinity of the orchid in any of the 3 treatment alternatives. Therefore, there will be no direct effects to the plant. Because of this site protection, the light, moisture, and disturbance conditions in the pogonia site will not change in the treatment alternatives. Indirect effects as discussed in the no action alternative, Alternative 1, as well as NNIS effects, will also apply to the treatment alternatives.

Potential effects from NNIS will be reduced by mitigation measures put into any timber sale contract that may be written for the Etowah Project. These measures are in the contract's Equipment Cleaning Clause BT6.35. This clause states that invasive species of concern must be indicated on the Sale Area Map. Furthermore, the clause gives specific requirements for cleaning of equipment when moving from infested (NNIS) to uninfested areas as well as direction regarding equipment inspection.

Cumulative Effects

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 TES and locally rare plants. The Georgia National Heritage Program (GNHP) records are checked for known occurrences of TES 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. Mitigating measures will be implemented where needed to maintain habitat for sensitive and locally rare species on the Forest, and to prevent future listing under the Endangered Species Act.

The Army Ranger training camp, Camp Merrill, has been located in the project area since the 1950's. The soldiers conduct training maneuvers in portions of the project area both on and off base. Several stands had areas that are evidently used for camping by the military, as well as well-worn trails through the areas. In the stand where the small-whorled pogonias are located, disturbance appeared to be confined to the ridges in the form of heavily-used trails, with no disturbance apparent in the area of the pogonias. The stand is not located on the base, and it is not expected that use by the Army will change in the next 10 years.

There are no additional actions planned in the vicinity of the Etowah River project area that would adversely affect federally listed species.

Terrestrial 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, 2 sensitive species are known to occur and 1 has the potential to occur in the vicinity of the project. In addition, 5 other species of viability concern locally (i.e. in Georgia) are also addressed here because they occur or potentially occur in the vicinity of the project (Table 23). This was determined by: (1) consulting 17 years of Forest Service plant inventory records, including project-level inventories conducted specifically for this project, (2) consulting Georgia Natural Heritage Program (GNHP) records, (3) reviewing U.S. Fish and Wildlife Service county lists for potential species in Union County, (4) ongoing discussions with GNHP, Forest Service, and other agency biologists, (5) various scientific references such as technical manuals, herbarium records, NatureServe information, and others.

Table 23: Viability Concern Species known (K) to occur or with potential (P) to occur in the Etowah River Project sites.

Scientific Name	Common Name	Status	Known (K) Potential (P)
<i>Collinsonia verticillata</i>	Whorled horsebalm	S	K
<i>Corynorhinus rafinesquii</i>	Rafineque’s Big-eared Bat	S	P
<i>Speyeria diana</i>	Diana Fritillary Butterfly	S	K
<i>Carex scabrata</i>	Rough Sedge	LR	K
<i>Juncus gynocarpus</i>	Naked-fruit rush	LR	K
<i>Condylura cristata</i>	Star-nosed Mole	LR	P
<i>Neotoma floridana haematoreaia</i>	Southern Appalachian Woodrat	LR	P
<i>Pituophis m. melanoleucus</i>	Northern Pine Snake	LR	P

Whorled horsebalm – This member of the mint family is known to occur in Alabama, Georgia, Kentucky, Maryland, North Carolina, Ohio, South Carolina, Tennessee, and Virginia. It is scattered throughout its range but can be locally abundant where it occurs. Habitat is described as moist, rich woods, and populations across its range are threatened by destruction of this habitat through activities such as mining, clearcutting, site prep, and land-use conversion (NatureServe 2007). Several extensive populations of *Collinsonia verticillata* were found in ravines in the project area. In all cases, the plants were located in mid to lower mesic slopes where no cutting will occur. Prescribed burning will be conducted during the dormant season when the horsebalm is below ground. There were no plants located in the proposed corridor of the lines to be bladed for the burn.

Rafinesque’s big-eared bat - There are no historic records for the Rafinesque’s big-eared bat in Lumpkin County (Laerm 1981, GNHP records) and no big-eared bats were

found during recent (2001-2002) mist netting on the Blue Ridge Ranger District. There are no known records of the Rafinesque's big-eared bat near the Etowah River project area.

The Rafinesque's big-eared bat hibernates primarily in caves and old buildings, usually near permanent water (Webster et al. 1985). Harvey et al (1999) state 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 buildings or in hollow trees (Harvey et al. 1999). 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 also contains standards (FW-090 and FW-091) that provide, during vegetation management treatments, for protection of existing snags and den trees that could serve as roosting habitat,. The Etowah River Project area does provide roosting habitat for the bat.

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 been observed in a variety of habitats throughout the Forest for the past 15 years (C. Wentworth, pers. comm.). Breeding habitats are primarily mesic, deciduous or mixed forests where numerous violets occur in the understory (NatureServe 2007). Because the butterfly 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. Several Diana fritillaries were observed in portions of the Etowah River project area during recent field visits to the area (C. Wentworth pers. comm.)

Rough sedge – The rough sedge is considered secure across its range which extends from Canada, down through New England, into the southeast. The primary threat to conservation of the plant is wetland drainage (NatureServe 2007). Several small populations of this locally rare sedge were found in streams in the project area. In all cases, the sedges were growing in the stream channel.

Naked-fruit rush – This rush occurs in bogs, seeps and streams in the mountains of northeastern Georgia, eastern Tennessee, western North Carolina, northwestern South Carolina, eastern Pennsylvania, and the Coastal Plain of southeastern Alabama, southern Mississippi, and north central panhandle Florida (Weakley 2007). It is apparently secure

throughout its range, but is locally rare in Georgia (NatureServe 2007). Several locations of the rush were found in seepages and small streams in the project area.

Star-nosed mole - The star-nosed mole is associated with moist swampy habitats such as marshes, bogs, seeps, and streams in both forested and early successional communities. Burrows near wet habitats may open directly into the water. Nests are constructed in burrows above water level (Webster et al. 1985, Laerm 1995). There are no records of this species in the vicinity of the Etowah River project area, but it could be found in association with the seeps and small streams in the area.

Southern Appalachian woodrat – This woodrat is known from Rabun, Union, Murray and Walker Counties (NatureServe 2007). GNHP also has a record from Lumpkin County. NatureServe (2007) states that this mammal is apparently secure throughout its range. The woodrat prefers deciduous forests and in the mountains is associated with bouldery cliffs, rock outcrops and bluffs, caves and rock crevices. It constructs large houses of sticks and leaves, often with various shiny objects the rat may find (Webster et al 1985). The woodrat deposits fecal droppings where they accumulate over time in specific sites away from the nest. These latrines are a characteristic of woodrat sites (Bunch et al. 2005, Webster et al. 1985). There are a few rocky sites in the proposed Etowah project area that could provide marginal habitat for the woodrat. No latrines were seen by C. Wentworth while conducting inventories.

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 Etowah River 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). The pine snake's diet consists primarily of small mammals (Martof et al. 1980).

Effects of Alternative 1 (No Action)

This alternative will perpetuate current conditions and therefore, no direct or indirect impacts to viability concern species will occur.

Effects Common to All Treatment Alternatives

Potential effects from NNIS will be reduced by mitigation measures put into any timber sale contract that may be written for the Etowah Project. These measures are in the contract's Equipment Cleaning Clause BT6.35. This clause states that invasive species of concern must be indicated on the Sale Area Map. Furthermore, the clause gives specific requirements for cleaning of equipment when moving from infested (NNIS) to uninfested areas as well as direction regarding equipment inspection.

Whorled Horsebalm – These sensitive plants are also protected through the Forest Plan objectives and standards Goal 15, Objective 15.1, and forest-wide standards FW-029 through FW-032. No cutting will occur in the ravines where the horsebalm occurs. Therefore there will be no direct impacts to the plants from timber cutting activities nor indirect impacts from changes in light regime. Prescribed burning is not proposed in the stands where the *Collinsonia* is present.

Some locations of the horsebalm could provide habitat for the Japanese stiltgrass. However, the grass is slow to invade undisturbed sites (NatureServe 2007). Japanese stiltgrass was not seen in the horsebalm sites. The locations do not provide the dry, sunny habitat required by autumn olive and sericea. No ground disturbance which would encourage establishment of these invasive plants will occur in the *Collinsonia* locations.

Rafinesque's big-eared bat - The revised Forest plan contains standards (FW-090 and FW-091) that provide for protection of existing snags and den trees that could serve as roosting habitat, 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, due to their abundance on the Forest, the availability of summer roost trees will not be affected. Because 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. Through time, repeated prescribed burning could damage some hollow trees that are used as summer roosts for Rafinesque's big-eared bats. 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 - There would be no direct effect of the proposed timber treatments on the Diana Fritillary. The proposed cutting 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 the butterflies 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). The fires normally die-out by the time they reach the mesic, damp areas where the overwintering larvae would primarily be located (i.e. next to violets). Therefore, this dormant season burn, which removes only the upper litter layers, should not adversely impact the Diana fritillary, and may improve habitat for the butterfly's nectar plants. In addition, because existing creeks and roads will be used

for much of the control lines, new ground disturbance that could uproot violets and nectar plants will be minimal.

If the Japanese stiltgrass were to spread into the mesic sites where violets occur, there could be an impact to the violets and therefore an indirect effect to the butterfly. However, there will be no ground disturbance in these streamside areas, and thus no potential spreading of the grass seeds from harvest activities. Also, there is some indication that late season burning may help to control the spread of *Microstegium* (Evans et al. 2006).

Rough sedge and Naked-fruit rush – Because all occurrences of the sedge and the rush were in the stream bed, the plants will be protected by riparian corridor standards (MRx 11) and Best Management Practices (BMPs). Prescribed burning will be conducted during the plants' dormant season, and any fire will die-out by the time it reaches the mesic streamside areas and the stream channel. The NNIS Japanese stiltgrass does occur in several streamside sites in the project area. However, the sedge and rush were found rooted in the water, and although the grass is tolerant of saturated soil, it will not establish in permanent water (Evans et al 2006, TNC 2007). There will be no ground disturbance in these streamside areas, and thus no potential spreading of the grass seeds from harvest activities. The locations of the sedge and rush are heavily shaded, and do not provide the dry, sunny habitat required by autumn olive and sericea, and thus the latter 2 species would not become established as a result of any proposed project activity.

Star-nosed mole - These sites will be protected through the application of riparian corridor standards (MRx 11) and Best Management Practices (BMPs). The prescribed fire will die-out by the time it reaches these mesic streamside areas. In addition, the moles can retreat to their burrows during any disturbance. As a result there will be no adverse impacts to potential habitat for the star-nosed mole.

Southern Appalachian woodrat – Although some rocky habitat for the woodrat occurs in the compartments and stands in the Etowah project, pine thinning and road daylighting is not proposed in these areas. As a result there will be no adverse impacts to potential habitat for the southern Appalachian woodrat.

Northern pine snake - Due the fact this snake spends a good portion of it's life underground, the proposed cutting and dormant season prescribed burning activities would have no direct impacts on this snake, which, if present, would likely retreat to its burrow. The treatments proposed (seedtree cut, thinning, burning) will result in the opening of the canopy and increase in herbaceous vegetation. This would likely benefit any northern pine snakes if present, by increasing habitat for the small rodents that serve as their prey.

Cumulative Effects

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 TES and locally rare plants. The Georgia National Heritage Program (GNHP)

records are checked for known occurrences of TES 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. Mitigating measures will be implemented where needed to maintain habitat for Sensitive and locally rare species on the Forest, and to prevent future listing under the Endangered Species Act.

The Army Ranger training camp, Camp Merrill, has been located in the project area since the 1950's. The men and women conduct training maneuvers in portions of the project area. Several stands had areas that are evidently used for camping by the military, as well as well-worn trails, primarily on the ridges. The impact areas were not located in the sites where the rare plants occurred, and it is not expected that use of the area by the Army will change within the next 10 years.

There are no additional actions planned in the vicinity of the Etowah River project area that would adversely affect viability concern species.

3.3 Social and Cultural

3.3.1 Scenery

Element: Visual Quality Analysis

3.2.1 Scenery

Visual Quality Analysis

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).

Bounds of Analysis:

The geographic bounds for this analysis 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, such as the Appalachian Trail. The temporal bounds for this analysis consider the short-term and immediate impacts which result from active timber management activities such as harvesting, skidding and hauling, and up to

10 years in the future, 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:

County Road 187, Wahsega Road, a primary travel way
County Road 72, Hightower Road, a primary travel way
County Road 107, Hidden Lake Road, a secondary travel way
Forest Development Road 28-1, a primary travel way
Forest Development Road 141, a secondary travel way
Forest Development Road 142, a secondary travel way
Forest Development Road 243, a secondary travel way
Forest Development Road 880, a secondary travel way
Forest Development Road 878, a secondary travel way
Forest Development Road 28F, a secondary travel way
Forest Development Road 28B, a secondary travel way
Forest Development Road 98, a secondary travel way
Jake & Bull Mountain Trail System, Black Branch Trail (223N), a secondary travel way
Jake & Bull Mountain Trail System, Jake Mountain Trail (223H), a secondary travel way
Jake & Bull Mountain Trail System, Nimblewell Branch Trail (223K), a secondary travel way
Appalachian National Scenic Trail, a primary travel way

The majority of the project area is located within Forest Plan prescription 9.H, Management, Maintenance, and Restoration of Plant Associations. Smaller portions are located within Forest Plan prescriptions, 9.F, Rare Communities and 9.A.1, Source Water Protection Watersheds. All riparian corridors fall under prescription 11, Riparian Corridors.

The landscape character goal envisioned for 9.H, Management, Maintenance, and Restoration of Plant Associations is *natural appearing*. These areas are characterized by a predominance of mid- and late-successional forests. Patches of early-successional forest will be clustered on the landscape. These areas will have evidence of management changes, but they are designed to be limited in size and low to moderate in contrast. The management emphasis is to restore historical plant associations and their ecological dynamics to ecologically appropriate levels. These areas are managed to provide the public with opportunities for dispersed recreation such as hunting, fishing, or hiking, but localized and limited development of facilities will be provided for those activities.

The landscape character goal envisioned for 9.F, Rare Communities is specific to the community covered by the prescription. In general, rare communities will be managed primarily through natural forces, but may be maintained through management activities,

to the extent needed to ensure a vigorous population. Recreational access may be limited in order to protect community integrity. These areas will be managed so that only exterior roads or pre-existing pass-through roads are open to public use. More specific to this project proposal, the community targeted for restoration activities is giant or river cane (*Arundinaria gigantea*). The giant cane community is characterized by monotypic stands of cane, usually with no or low densities of overstory tree canopy. Management for cane is typically overstory reduction.

The landscape character goal envisioned for 9.A.1, Source Water Protection Watersheds is *natural appearing*. These areas are managed for source water protection. The management emphasis is to restore watershed function where human activities are degrading or have degraded water quality. These areas will be managed to provide primarily non-motorized, dispersed recreation, such as backpacking, bird watching, dispersed camping, fishing, hiking, hunting, etc. Limited and rustic amenities will be provided. Natural-appearing change may occur but will affect a very limited area either individually or cumulatively at any one time. Active management may occur to moderate visual contrasts of natural change but obvious evidence of human intervention in the appearance of the landscape is rare. Forest management activities such as prescribed fire and silvicultural treatments may be used to maintain a healthy forest. These areas will be characterized by forest cover being mid-successional, late-successional, or potential old growth.

Areas under management prescription 11, Riparian Corridors Prescription, are managed such that ecological processes and functions are retained, enhanced and/or restored within riparian corridors.

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 and shortleaf pine plantations. Shortleaf, loblolly (*Pinus taeda*) and white pine stands in the project area would continue to degenerate from Southern Pine Beetle (SPB) mortality and degrade visual quality, especially along FDR 141, 28F and 28B.

Effects Common to Action Alternatives and the Proposed Action:

Direct/Indirect Effects:

Restore Rare Communities: Table Mountain Pine – Restoration of table mountain pine is proposed to occur within three stands of compartment 571, equaling approximately 108 acres. These stands are located off of FDR 141, due west of the Camp Merrill U.S. Army Base. Existing vegetative composition of these stands includes a mix of shortleaf, yellow and white pines with mixed oak species. All three have a small

percentage of mature table mountain pine but lack any table mountain pine regeneration. This area is proposed to be thinned from a current basal area of 130 square feet per acre to an average of 40 square feet per acre. Elevation of these stands range from 1800' – 2075'.

The stands are visible from observer positions along FDR 141 for varying distances up to ¼ mile. Any modifications to the landscape will affect the visual quality along the travelway, identified as secondary in importance. In addition, portions of stands 27, 28, 29 and 31 have the potential to be seen, especially during leaf-off, from the Appalachian National Scenic Trail (see Viewshed Analysis Map).

Restore Rare Communities: Oak, Oak-Pine – Restoration of oak/ oak-pine communities is proposed to occur within two stands of compartment 566. These stands are located off of County Road 187 (Wahsega Road), just southeast of Hidden Lake Academy. Elevation of these stands range from 1700' – 2000'. Predominant overstory vegetation within these stands includes Virginia, white and shortleaf pine, as well as, oak. The stands show evidence of Southern Pine Beetle mortality, a blatant deviation from the surrounding landscape character. This area is proposed to be thinned from a current basal range of 120 to 170 square feet per acre to an average of 65 square feet of residual basal area to promote oak and shortleaf pine regeneration. With this project, the area can move back towards a more visually pleasing landscape.

The stands are visible from observer positions along FDR 880 for varying distances up to 1/8 mile. Any modifications to the landscape will affect the visual quality along the travelway, identified as secondary in importance.

Restore Rare Communities: Canebrake – Restoration of canebrake is proposed to occur within stand 1, compartment 586. This stand is located off of County Road 72 (Hightower Road), just south of Pierce Cemetery. This project area borders the Etowah River and includes a walnut grove, small pine plantation and a natural patch of river cane. White pines have stifled the proliferation of rivercane along the river's edge. Restoration activities would allow the rivercane to occupy an additional 2 acres of area by eliminating the dense overstory. With this project, the area can move back towards a more natural appearing landscape character, showcasing a truly unique and rare community in this area.

The stands are remotely visible from observer positions along County Road 72 (Hightower). While modifications to the landscape will be high contrast to pre-existing conditions, the affect on scenery is alleviated by the fact that the proposed changes will promote a natural landscape. In addition, expansion of rivercane will reinforce a greater “sense of place” for this unique area.

Southern Pine Beetle Prevention – Southern pine beetle prevention, through commercial thinning, is proposed to occur within nine stands of compartments 567, 571 and 586. Compartment 567 is located off of County Road 187 (Wahsega Rd.), just north of Hidden Lake Academy. Compartment 571 is located off of FDR 141, one mile due

west of Camp Wahsega. Compartment 586 is located off of FDR 28B, in between Moss Creek and Black Branch. Existing vegetative composition of these stands includes a range of shortleaf, loblolly and white pines with mixed upland hardwoods. These areas are proposed to be thinned from current basal areas ranging from 110 to 150 square feet per acre to an average of 60 square feet per acre. While these areas will have evidence of management changes, they will be limited in size and improve the overall landscape character by restoring historical plant associations. Most importantly, the project proposal will maintain stand vigor and reduce the potential for unsightly southern pine beetle kill.

Creation of Early Successional Forest Habitat: Wildlife Openings – Enhancement of 13 wildlife openings is proposed to create early successional forest habitat around the openings. The landscape character goals, for each of these areas, are natural appearing. Natural appearing change may occur but will affect a very limited area, as in this case. The scenic benefits of this proposal would include increasing hunting opportunities and wildlife viewing opportunities, as well as increasing visitor’s association with these areas to wildlife management.

Creation of Early Successional Forest Habitat: Road Daylighting – Road daylighting is proposed to occur along FDR 141, 142 and 28F. Approximately four miles of road would be daylighted by thinning adjacent forest habitat to 30 square feet of basal area for a distance of 50 feet from each side of the road. Mast producing oaks, hickories, black gum and yellow pine would be retained. The direct effect to scenery can be represented through the following photographs, showing the current character of stand 13, compartment 586 and a comparable area thinned to approximately 30 square feet per acre, shown after a two year recovery period. Although the management contrast is high, the effects to scenery, specifically for wildlife viewing and habitat, will be beneficial after a full season of regeneration.



Figure 5: View from FDR 28F



Figure 6: View of Early Successional

Access/Road Management & Maintenance – Road maintenance, following commercial timber cutting, is proposed for FDR 98, 141 and 880. For this type of improvement, no significant affects to scenery would occur.

Soil and Water Improvement – Road closure and re-vegetation, for the sake of improving soil and water quality, is proposed for a 500 foot section of an unnamed road. For this type of improvement, no significant affects to scenery would occur.

Stream Habitat Enhancement – Stream habitat enhancement along Montgomery Creek and the Etowah River would not significantly affect landscape scenery in either of these areas.

Effects Specific to Action Alternatives and the Proposed Action:

Alternative 2 (Proposed Action)

Direct/Indirect Effects: Nothing further to be discussed.

Alternative 3

Direct/Indirect Effects: The additional actions, as identified for Alternative 3, would include the use of mechanized equipment and/or burning to promote table mountain and shortleaf pine regeneration. Such activities would control competition and maintain the improved landscape character of the area, especially for stands 1 and 13 of compartment 566. In addition, Alternative 3 proposes to eliminate portions of stands 19 and 21 in compartment 566, from the project proposal. These areas are located in the southeastern and southwestern portions of the stands and also coincide with the areas classified with a Scenic Integrity Objective of HIGH. Due to the visibility of these areas and their scenic attractiveness, eliminating these areas would eliminate the need for stringent mitigation measures.

Alternative 4

Direct/Indirect Effects: The additional actions, as identified for Alternative 4, would include the use of mechanized equipment to control competition by white pine and Virginia pine saplings in stands 19 and 21 of compartment 566 and stands 27, 29 and 31 of compartment 571. By allowing these activities, the natural appearing landscape would be maintained over time with few interruptions in the landscape.

Cumulative Effects:

While the proposed actions would result in low to moderate, and in few cases drastic, changes to the landscape, the future advantages to the scenery of the area would include the following:

Increased opportunity for wildlife viewing
Increased visual diversity within the forest
More natural appearing landscapes comprised of historical plant composition
Decreased likelihood for unsightly insect infestations
Decreased likelihood for a catastrophic fire event

The activities proposed for the Etowah River project area would not significantly change the landscape character of the surrounding area. There are no other scenery improvement projects planned for this area at this time. Therefore, no further cumulative effects to scenery are expected.

Figure 7: Visual Quality Analysis: Scenic Integrity Objectives Map.

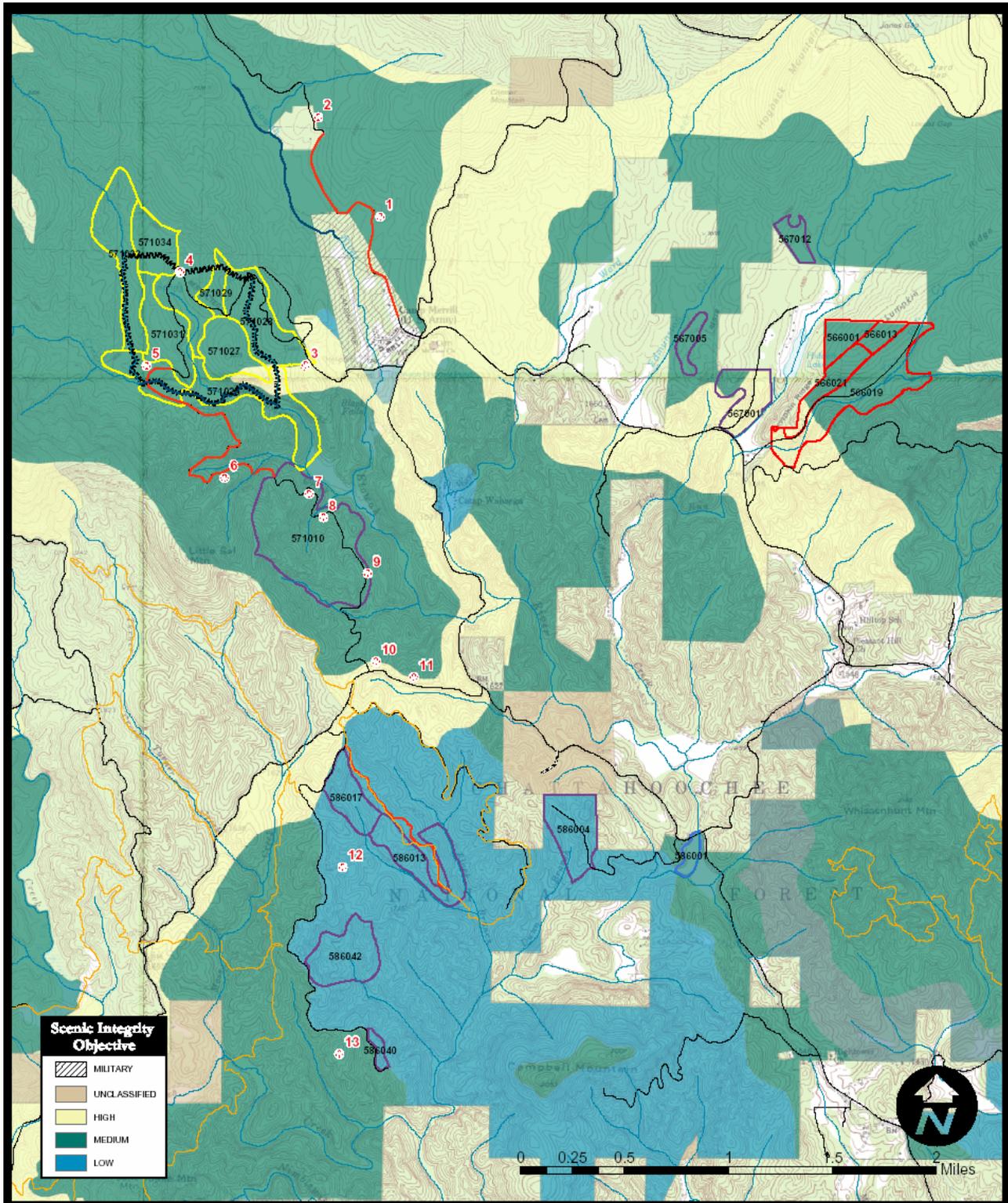
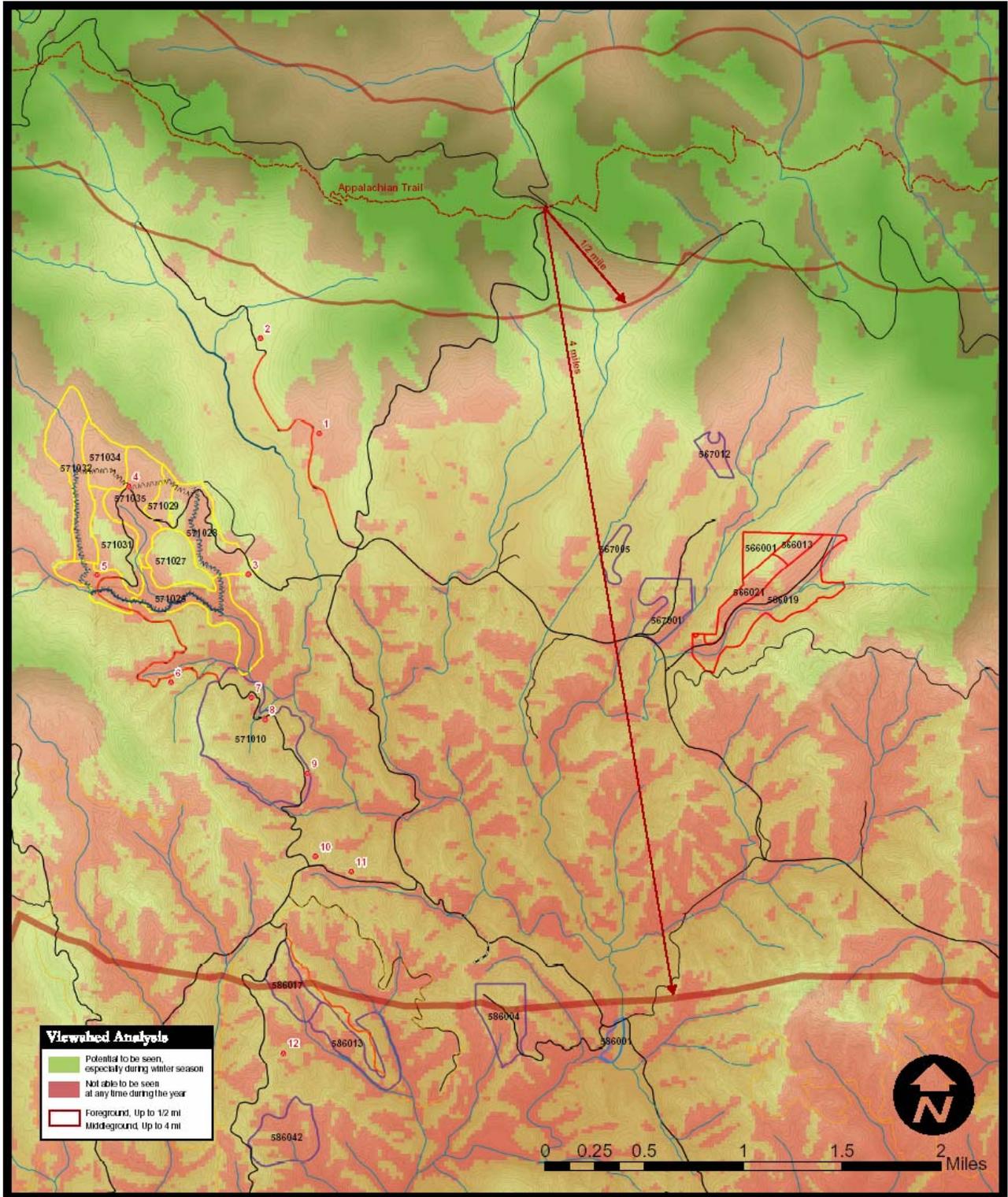


Figure 8: Visual Quality Analysis: Viewshed Analysis from the Appalachian National Scenic Trail



3.3.2 Recreation

Element: Recreation

Bounds of Analysis:

The geographic bounds for this analysis contain approximately 700 acres within the Etowah River Watershed, including, most significantly, the recreational corridors of Forest Development Roads 28F, 28B and 141 which provide vehicular and non-vehicular access to the project area. The temporal bounds for this analysis consider the short-term and immediate impacts which result from active timber management activities such as harvesting, skidding and hauling, and the longer-term impacts which may or may not alter the recreational use of the project area over the next ten years.

Existing Conditions:

The proposed project is located in western Lumpkin County, and is easily accessible from the east (Wahsega Road to FDR 28-1) and south (Georgia Highway 52 to Nimblewell Road) by local and visiting public coming from the town of Dahlonega. It is reported that more than 325,000 people visit the Dahlonega Welcome Center each year, many seeking recreational opportunities within the surrounding area and on the Chattahoochee National Forest (*source: Dahlonega Welcome Center*). The recreation being sought in this area is dispersed in nature and includes bicycling, hiking, horseback riding, hunting, fishing and dispersed camping.

The major recreational use within the project area, of those listed above, consists of bicyclists and equestrians riding the 30+ mile Jake and Bull Mountain Trail System. The Jake Mountain Trail System and the Bull Mountain Trail System connect to form a complex system of scenic trails, totaling approximately 35 miles, within a four (4) square mile area of the Chattahoochee National Forest. Jake and Bull is open to hikers, bicyclists and horseback riders, only. The system is made up of interconnecting single-track dirt trails, old logging roads and open gravel roads through the Chattahoochee National Forest, including a portion of the Blue Ridge Wildlife Management Area. Grassed over logging decks, riparian zones, mixed stands of hardwood and pine, and wildlife openings attract birds, deer, turkey and bear which can be observed as the visitor moves along the trail system. As such, the trail system attracts recreationists not only from the local community of Dahlonega, but from the metropolitan Atlanta area and surrounding states, as well.

Beyond the Jake and Bull Mountain Trail System for bicycle and horseback riding, the project area is utilized by the public for dispersed camping, hunting and fishing. Evidence of dispersed camping in light numbers (3 campsites) can be seen along Forest Development Road (FDR) 141, just south of the Montgomery Creek crossing. In

addition, dispersed camping occurs along FDR 880 and FDR 28F. For these areas, dispersed camping use is light and evidenced only by cleared areas with man-made fire rings. Most camping activities coincide with scheduled hunt and trout seasons. Heavier dispersed camping use occurs along FDR 28-1, near the crossing of Montgomery Creek. Impacts of the proposed project to this area, however, would be minimal.

Hunting is common throughout the Blue Ridge Wildlife Management Area (WMA), which encompasses all project areas west of Forest Development Roads 28-1 and 80. Hunting for deer, bear, turkey and small game are allowed within the Blue Ridge WMA during specified hunts. To ensure safety, the Bull Mountain Trails are closed all day during primitive weapons and firearms deer seasons and before 10:00 AM EST during archery and turkey seasons.

Fishing is common along the Etowah River near the proposed canebrake restoration project area, located adjacent to the Etowah River and Hightower Road. Fishermen frequently park along the county road and access the river through national forest. This is evidenced by several informal paths leading from the east side of Stand 1, Compartment 586 to the river's edge.

No developed recreation opportunities exist in the project area. Other outdoor-related recreation uses are minimal and, for this reason, will not be analyzed.

Effects of Alternative 1 (No Action)

Direct Effects: If no action is taken, recreational opportunities and use patterns will remain consistent with the current situation. Therefore, no direct effects will result.

Indirect Effects: If no action is taken, recreational opportunities and use patterns will remain consistent with the current situation. Therefore, indirect effects will be inconsequential.

Effects Common to Action Alternatives and the Proposed Action:

Within the geographic and temporal bounds of this analysis, the scope of work for each action alternative, including the proposed action, varies only slightly. Those modifications, which make each alternative unique, are insignificant to the effects on recreational activities in the area. Therefore, a majority of discussion will address the effects, simultaneously, as they are common to Alternative #2, #3 and #4, as outlined below.

Direct Effects: The seedtree cut, thinning, road daylighting and restoration actions, as proposed in each of the alternatives (2-4), would effect recreational activities within the project area. In response to these effects, certain mitigation measures should be taken to

ensure public safety, especially within the Jake and Bull Mountain Trail System, as noted in Chapter 2.

Jake and Bull Mountain Trail System- Most important to recreation, there are three proposed actions, which would affect the Jake and Bull Mountain Trail System and its use. These include: 1) Southern Pine Beetle prevention in Stands 40 and 42 of Compartment 586, along FDR 28B, 2) Southern Pine Beetle prevention in Stands 13 and 17 of Compartment 586, along FDR 28F, and 3) Daylighting of FDR 28F.

1) Southern Pine Beetle prevention in Stands 40 and 42 of Compartment 586, along FDR 28B- Although not heavily used, a portion of Forest Development Road (FDR) 28B, from where it meets FDR 28-1 until its intersection with the Jake Mountain Trail, is used as a connecting trail by bicyclists and equestrians, alike. This road provides an alternative for travel rather than continuing along the Jake Mountain Trail, and also provides the most direct connection to the Black Branch Trail. For this reason, hauling operations along this road would potentially affect recreationists in this area.

2) Southern Pine Beetle prevention in Stands 13 and 17 of Compartment 586, along FDR 28F- Forest Development Road 28F, in its entirety, coincides with a portion of the Black Branch Loop Trail. This popular trail uses FDR 28F, beginning at its intersection with FDR 28B, for its entire duration until meeting Black Branch where it continues as a trail, only. Thinning of Stands 13 and 17 along this road would significantly affect recreationists in this area because logging activities would result in either partial or complete trail closure during the contractual period. Thinning operations would require use of this road/trail as a haul or skid road during operations. Such activities will change the track width and dip profile of the existing road/trail.

Fortunately, the Jake and Bull Mountain Trail System offers over 35 miles for riding or hiking, so the overall impact would be minor. However, users would lose approximately six miles of trail opportunity.

3) Daylighting of FDR 28F- The current character of Forest Development Road 28F can be described as multi-staged. The road begins as a partially graveled ridge-top road, relatively flat and with a comfortably cleared corridor (approximately 15' clearing). After approximately 1 mile from the connection with FDR 28B, the road narrows significantly as it drops from the southern edge of the ridge and descends towards Black Branch. This portion of FDR 28F is based in dirt and resembles a trail in character. For this reason, daylighting would significantly alter the 1-3 year character of this section, and subsequently the character of the Black Branch Trail.



Figures 9 & 10: Transitioning road characteristics along Forest Development Road 28F

In addition to the change in its aesthetic character, widening and improving this road would encourage motorized vehicles to drive within 200 feet of Black Branch without an adequate turning radius to exit.



Figure 11: Access to Black Branch crossing

However, a likely benefit to recreationists from daylighting FDR 28F is that early successional forest habitat would be created, thus enhancing wildlife viewing for bicyclists, horseback riders and hikers by increasing the number of songbirds, small game and large game to the trail corridor.

Traffic- Increased traffic by logging trucks along FDR 28-1 could cause potential conflicts and safety concerns with recreationists in the area, particularly those enjoying the Jake and Bull Mountain Trail System. Because of its current layout, bicyclists and horseback riders are often forced to use portions of FDR 28-1 to connect to other trails within the Jake and Bull Mountain Trail System. Increased road traffic by heavy and

raucous hauling trucks could potentially spook young horses and riders or be the cause of collision.

Hunting and Dispersed Camping- In the proposed actions, hunting opportunities would potentially be enhanced through the creation of 34 acres of early successional forest habitat around existing wildlife openings. The proposed actions include enhancing 13 wildlife openings, 11 within the Blue Ridge Wildlife Management Area (WMA). Specifically, hunters would benefit from those openings located along FDR 141 (and also within the Blue Ridge WMA), where dispersed campsites are already established. During the implementation phase of table mountain pine stand restoration along FDR 141, hunting activity and associated dispersed camping may be limited to ensure public safety.

Fishing- Fishing opportunities along the Etowah River for a small section in Stand 1 of Compartment 586 would be affected during canebrake community restoration implementation. However, this direct impact is negated by the fact that many other fishing opportunities exist on the Chattahoochee National Forest and within the local vicinity which would provide alternate opportunities. In addition, the proposed action would address only 2 acres along the Etowah River and, as such, implementation would occur very quickly.

Indirect Effects: Greatly reducing stem density and other actions associated with the vegetation management aspect of this alternative will have the potential of increasing off-trail horseback riding and/or mountain bicycling in this area. Open understory is traditionally inviting to those looking for a safe, but more challenging, ride.

Similarly, closure of portions of the Jake and Bull Mountain Trail System during project work might lead to increased off-trail horseback riding or illegal cross-country mountain bicycling by users seeking to bypass the closed sections.

An increase in soft mast and browse, as the areas within Compartments 571 and 586 are changed in character, might offer long term increases in hunting opportunities for both areas. Wildlife scenic viewing is likely to be enhanced, as the early successional forest environment is more open and enticing to songbirds and edge species.

Effects Specific to Action Alternatives and the Proposed Action:

Alternative 2 (Proposed Action)

Direct Effects: Nothing further to be discussed.

Indirect Effects: Nothing further to be discussed.

Alternative 3

Direct Effects: The additional actions as identified for Alternative 3 would not have an impact on recreational activities within the project area. Therefore, there is nothing further to be discussed.

Indirect Effects: The additional actions as identified for Alternative 3 would not have an impact on recreational activities within the project area. Therefore, there is nothing further to be discussed.

Alternative 4

Direct Effects: The additional actions as identified for Alternative 4 would not have an impact on recreational activities within the project area. Therefore, there is nothing further to be discussed.

Indirect Effects: The additional actions as identified for Alternative 4 would not have an impact on recreational activities within the project area. Therefore, there is nothing further to be discussed.

Cumulative Effects:

There is existing evidence of Southern Pine Beetle infestation along the eastern portion of the Black Branch Loop Trail (within the Jake and Bull Mountain Trail System), between Black and Dunn Branch. The result of such damage has led to hazardous conditions along the trail corridor, in previous years. To mitigate this damage, hazard trees have been cut to avoid the potential for falling across the trails and disrupting travel or injuring visitors. The proposed action alternatives would reduce the number of overstocked pine within Stands 13 and 17 of Compartment 586, and would, in time, help reduce the chances for Southern Pine Beetle infestation in the areas along the Black Branch Trail. These preventive measures would reduce the need for further maintenance, such as hazard tree removal, to accomplish these same objectives in the future should damage occur.

An assessment of the Jake and Bull Mountain Trail System is likely to be conducted beginning in the spring of 2008. This analysis will focus on the immediate and long-term maintenance needs of the trail system, including stream crossings, trail relocations and additional infrastructure needed. While the analysis will be limited to the trail corridors of the Jake and Bull Mountain Trail System, it will include some overlapping areas to the proposed actions. However, the activities planned for the Etowah River project area would not significantly affect the analysis.

3.3.3 Cultural Resources

Element: Cultural Resources

Measure: The measure of this effect is the number of sites found within the project area and their potential disturbance within the project area.

Bounds of Analysis: The spatial analysis for the Etowah River project is the entire 847 acre project area where ground disturbing activities are proposed. The temporal bound for this analysis would be during the proposed action, whereas the cumulative effects would be indefinite until another project is proposed in or near the same area. Monitoring of protected sites will continue after project completion as part of the Forest's heritage resources management, and sites found during this survey will be on record for future projects in the area.

Existing Conditions

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 and sites 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). 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 the Etowah River project.

Our knowledge of the cultural resources within the Etowah River Watershed project area comes from current and previous surveys. A cultural resource survey was conducted for this project during the summer of 2007. This survey covered the entire 847 acres as proposed. Five previous surveys (Bruce 1997, Bruce and Davis 1992, Bruce and Wynn 1990, Fortune 1978, Shumate et al. 1993) in this project area have resulted in 19 previously recorded sites within the proposed project area. In consultation with the SHPO on those five previous reports, seven sites were determined potentially eligible or eligible for the National Register (NRHP) and 12 sites were determined not eligible. Additional testing on the seven sites has concluded that only one of those seven sites would meet National Register criteria today. During the current 2007 inventory for this project, five new sites have been recorded and four of these are recommended as ineligible for the National Register, and one is recommended as eligible for the NRHP. Of the total twenty-four sites recorded within the project area, three of these sites are recommended for protection and they will be marked in the field prior to any ground disturbing activity. The other 21 sites require no further work. All sites recommended as eligible will be marked in the field with a buffer.

Effects of Alternative 1 (No Action)

Direct and Indirect Effects – 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 and Indirect 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. However, a cultural resource inventory of the 847 acres has been completed and sites identified for protection.

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.

Cumulative Effects

The combined effect of past, present, and future Forest Service activities is the ever-growing identification and protection of heritage properties and reports made 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. Based on our inventory and mitigation measures there should not be any adverse cumulative effects on sites recommended as eligible for the NRHP.

Effects of Alternative 3

Direct and Indirect Effects- This alternative would modify the proposed action; however, the modifications have been inventoried within the 847 acres surveyed for the proposed action. The direct and indirect effects would remain the same as well as sites remain the same.

Cumulative Effects

The cumulative effects would be the same as Alternative 2.

Effects of Alternative 4

Direct and Indirect Effects- This alternative would be the same as Alternative 2. Sites and areas surveyed remain the same.

Cumulative Effects

The cumulative effects would be the same as Alternative 2.

3.3.4 Road Management

Element: Roads

Measure: Miles of roads and maintenance needed for this project.

Bounds of Analysis: The spatial bounds of analysis will be the Etowah River Watershed Project Area. The temporal bounds of analysis will be for project activities that occur for the next ten years.

Existing Conditions

Road access is an integral element in managing and protecting National Forest resources, including the vegetation management projects proposed in the Etowah River watershed project. The project area has an existing network of Forest Service, county and state roads in place to provide adequate access to the locations proposed for treatments.

Several of the Forest Service roads identified for the proposed projects are used by the Camp Merrill U.S. Army Training Facility (FS 28-1, FS 141, FS 142). Forest Service Road 28-1 is a main road, open year round used to access the Camp Wahsega 4-H Camp, Camp Merrill facilities, and numerous recreation use sites along the roads and streams in the area. County road access into the project area exists via the paved Wahsega Road from the east (GA Highway 60) and Forest Service Road 28-1 from the south, which intersects the paved Hightower Church Road which leads to GA Highway 52.

Approximately 18.55 miles of permanent system road have been identified as needed for primary access as listed in Table 24.

Effects of Alternative 1 (No Action)

Roads have been identified as a source of water quality impacts in the Etowah River watershed. Forest Service Roads 98, 878 and 880 and the unnamed road west of Pierce Cemetery have been inventoried as needing maintenance to correct existing drainage problems. If no action is taken these roads will have continue to have an impact on water quality in the Etowah River watershed.

Effects Common to Action Alternatives and the Proposed Action

The treatments proposed in the project area will provide an opportunity to improve road conditions and update maintenance. Drainage improvements on roads in the project area will lead to a decrease in sedimentation and have a positive impact on water quality in the Etowah River Watershed.

Table 24: Etowah River Project Roads – Condition Status

Road Number	Road Name	Length in Miles	Maintenance Level	Surface Type
28-1	Nimblewill	3.5	3	gravel
28-B	Moss Hill	2.5	2	gravel
28-F	Upper Nimblewill	1.0	1	gravel

98	Dunn Branch	1.1	2	spot gravel / native material
141	Montgomery Creek	5.7	2	gravel
142	Hightower	1.25	2	gravel
878	Hidden Acres	2.0	1	spot gravel / native material
880	Two Run Creek	1.5	2	spot gravel / native material

Existing locations and alignments of the roads listed in Table 24 have been evaluated for the proposed projects and are acceptable for the proposed treatments, requiring no reconstruction or changes in maintenance level. However, several road segments will require maintenance treatments prior to operation periods for the proposed treatments (Table 25). These maintenance treatments may include blading of the roadbed surfaces, improvement to drainage structures, addition of gravel on roadbed surfaces, and revegetation of road shoulders or other soil exposure areas to stabilize areas disturbed along roads. A short road has been identified on a tract acquired within the past five years about one quarter mile west of Pierce Cemetery. This road, about 1000 feet in length, is not needed for the project treatments and will be closed to vehicle use and revegetated to stabilize exposed soils.

Temporary access routes will be needed in stands proposed for cutting treatments. These locations will intersect existing system roads, used during harvesting operations and then closed to vehicle use and revegetated to stabilize disturbed soils.

Table 25: Etowah River Project Road Uses and Management Status

Road Number	Road Name	Stands Accessed	Proposed Treatments	Management Status (Closure Periods)
28-1	Nimblewill		Project Access	Open Year Round
28-B	Moss Hill	586-042, 586-040	Thinning treatments	Gated – open for public hunting seasons
28-F	Upper Nimblewill	586-013, 586-017	Thinning treatments, road daylighting	Gated – open for administrative use
98	Dunn Branch	586-04, 586-01	Thinning treatments	Gated – open for public hunting seasons
141	Montgomery Creek	571-010, 571-031, 571-029, 571-027	Seedtree Cutting, thinning treatments, stand restoration, prescribed burning, daylighting of road & wildlife openings	Gated – open for public hunting seasons
142	Hightower	569	Stream structures on Etowah River,	Open year round, access limited @

			daylighting of road & wildlife openings	Camp Merrill security gate
878	Hidden Acres	567-01, 567-05, 567-012	Thinning treatments	Gated – open for public hunting seasons
880	Two Run Creek	566-019, 566-021	Thinning treatments	Open year round

Effects of Alternative 3

There will be no direct or indirect effects other than those described in the effects common to the proposed action and action alternatives.

Effects of Alternative 4

There will be no direct or indirect effects other than those described in the effects common to the proposed action and action alternatives.

Cumulative Effects

Periodic routine maintenance will occur on the roads in the project area, especially those that are open to year-round use. There are no other projects currently proposed in the area for the next 10 years, so cumulative effects will include those listed in the effects common to the proposed action and action alternatives and those that come from future road maintenance.

3.3.5 Human Health and Safety

Element: Human Health and Safety

Measure: Measure will consist of safety concerns related to prescribed burning procedures and timber harvesting operations.

Bounds of Analysis: The spatial bounds of analysis will be the Etowah River Watershed Project Area. The temporal bounds of analysis will be for project activities that occur for the next ten years.

Existing Conditions

The Etowah River Watershed Project Area receives a lot of recreational use such as hiking, hunting, fishing in streams, nature viewing, and trail use on the Jake/Bull Mt. Trail Complex, which is open to horses and bike users.

Effects of Alternative 1 (No action)

Direct Effects

If no action is taken then conditions will remain the same as they currently are. There would be no direct effects on safety regarding timber harvesting or prescribed burning.

Indirect Effects

With no action taken there will be no indirect effects.

Cumulative Effects

With no action taken there will be no cumulative effects.

Effects Common to Action Alternatives and the Proposed Action**Direct Effects**

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. Posting of logging activities on the forest website and on trailhead information boards for the Jake and Bull Mountain trail complex would be done to inform users if the proposal is implemented. If possible, work will be scheduled during the winter when trail use is not as heavy.

Indirect Effects

There will be no indirect effects common to all the proposed action and all action alternatives.

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.

Effects of Alternative 2 (Proposed Action)**Direct Effects**

One potential danger of prescribed fire would be the escape onto private property. In this alternative the burning would occur approximately 0.6 miles from a small piece of privately owned property and is therefore not a great risk. 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.

Indirect Effects

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 timber harvest and the construction of the firebreak. If a fire were to occur, there would be a reduced volume of smoke as a result of harvesting.

Effects of Alternative 3

Direct Effects

One potential danger of prescribed fire would be the escape onto private property. In this alternative the burning would occur at two locations. The burning for table mountain pine restoration would occur approximately 0.6 miles from private property and is not a great risk. The second burning area would be adjacent to private property on its northern control line. This presents the greatest risk and potential direct effect. However, this also provides a control line for any potential wildfires that may occur in the future. 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.

Indirect Effects

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 timber cutting and the construction of the firebreak. If a fire were to occur, there would be a reduced volume of smoke as a result of harvesting.

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.

Effects of Alternative 4

Direct Effects

There are no direct effects for Alternative 4 other than those described in the effects common to the proposed action and action alternatives. There is no prescribed burning proposed under this alternative.

Indirect Effects

There are no indirect effects for Alternative 4 other than those described in the effects common to the proposed action and action alternatives

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.

3.3.6 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 Jake and Bull Mountain Trail Complex will be temporarily affected due to increased traffic and temporary closure of a small portion of the trail during the timber harvest operations. Hunters as users should see increases in game populations including wild turkey and white-tailed deer as well as songbirds and small mammals. Sightseers would see a short-term increase in contrast from 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.

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Appendices

Appendix A. Agencies And Individuals Providing Consultation

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

Charles Jackson, Chattahoochee-Oconee National Forests, Timber Sale Administrator

Sheldon Henderson, Blue Ridge Ranger District, Chattahoochee National Forest, Timber Management Assistant (retired)

Scott Frazier, Georgia Department of Natural Resources, Wildlife Biologist

Dr. Thomas Waldrop, USDA Forest Service, Southern Research Station, Research Forester.

Appendix B. Persons, Agencies, and Organizations Providing Public Input

Edwin Dale

Wes Thurmond

Monte Seehorn

Mark Banker – Ruffed Grouse Society

Bill Cunningham - Ruffed Grouse Society (Georgia Chapter)

Debbie Crowe – Chattahoochee Trail Horse Association

Denny Rhodes - Georgia Appalachian Trail Club

Diane Minnick - Upper Etowah River Alliance

Morgan Sommerville - Appalachian Trail Conservancy

Wayne Jenkins – Georgia Forest Watch

Ken Riddleberger – Georgia Department of Natural Resources

Appendix C.
Persons and Organizations Notified of the Proposed Action

On April 2, 2007 105 entities were mailed a scoping letter detailing the proposed actions of the Etowah River Watershed Project. The mailing list for the scoping letter is in the project file.

Appendix D.
List of Preparers

Name	Title
Becky Bruce	Archeologist
Steve Cole	Forester
Alison Koopman	Outdoor Recreation Planner
Kate Metzger	Hydrologist Trainee
Rachelle Powell	Wildlife Biologist Trainee
Dick Rightmyer	Soil Scientist
Cindy Wentworth	Botanist/Ecologist
Jim Wentworth	Wildlife Biologist

Appendix E. Scenery Mitigation Measures

Etowah River Watershed Visual Mitigation Measures	Commercial/Non-Commercial Thinning			Create Maintain Wildlife Habitat, Restore PETS and Native Communities			Prescribed Burn			Roadside Maintenance			Temporary Road/Skid Trail Construction			Trails Construction, Rehabilitation, Reconstruction		
	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L
TREATMENTS	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L
A. Trees are selectively removed to improve scenery within high use areas, vista points, and along interpretive trails.	X	X								X	X	X	X	X	X	X	X	X
B. Flowering and other visually attractive trees and understory shrubs are favored when leaving vegetation.	X	X	X	X	X	X				X	X		X	X	X	X	X	X
C. During temporary or permanent road construction, slash and root wads are eliminated or removed from view in the immediate foreground to the extent possible. Slash may be aligned parallel to roads at the base of fill slopes to collect silt, but only to the extent it provides this function.	X												X					
D. Slash is removed, burned, chipped or lopped to within an average of 2 feet of ground, when visible within 100 feet on either side of Concern Level 1 travel routes. Slash is treated to within an average of 4 feet of the ground when visible within 100 feet on either side of Concern Level 2 travel routes.	X	X		X	X	X	X	X								X	X	X
E. Root wads and other unnecessary debris are removed or placed out of sight within 150 feet of key viewing points.	X	X		X	X		X	X					X	X		X	X	X
F. Stems are cut to within 6 inches of the ground in the immediate foreground.	X						X			X	X					X	X	X
G. Leave tree or unit marking is applied so as to not be visible within 100 feet of Concern Level 1 and 2 travel routes.	X	X		X	X					X	X		X	X				
H. Consider scheduling work outside of major recreation seasons.	X	X		X	X	X	X	X	X	X			X	X		X	X	X
I. Special road and landing design is used. When possible, log landings, roads and bladed skid trails are located out of view to avoid bare mineral soil observation from Concern Level 1 and 2 travel routes.	X	X		X	X								X	X				

Etowah River Watershed Visual Mitigation Measures, continued	Commercial/Non-Commercial Thinning			Create Maintain Wildlife Habitat, Restore PETS and Native Communities			Prescribed Burn			Roadside Maintenance			Temporary Road/Skid Trail Construction			Trails Construction, Rehabilitation, Reconstruction		
	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L
TREATMENTS																		
J. An actual opening size up to 1.5 - 2 acres is appropriate, based on desired landscape character.																		
K. An actual opening size up to 5 acres is appropriate, based on desired landscape character.				X Create														
L. An actual opening size up to 10 acres is appropriate in the foreground zone and 25 acres in middleground and background zone in Concern Level 1 and 2 travel routes.				X Restore														
M. An actual opening size up to 25 acres with inclusions is appropriate.				X Maint.														
N. An actual opening size up to 40 acres with inclusions is appropriate. Larger openings are allowed in certain forest types based on specific Forest Plan direction.					X													
O. Along Concern Level 1 and 2 travel routes, openings should be spaced at a minimum of 1000 feet apart next to the travelway.																		
P. Along Concern Level 1 travel routes, openings of up to 200 linear feet are appropriate. Along Concern Level 2 travel routes, openings of up to 400 linear feet are appropriate.																		
Q. Removal of overstory is delayed until understory is 10 feet in height.																X	X	X
R. Utility rights-of-ways are located and maintained to conform with natural-appearing patterns of vegetation to the extent possible.																		
S. Overhead utility lines and support towers are screened where possible. Structures have finishes that reduce contrast with the desired landscape character.	X	X														X	X	
T. The visual impact of roads and constructed fire lines is blended so that they remain subordinate to the existing landscape character in size, form, line, color, and texture.	X	X	X	X	X	X				X	X	X	X	X	X			

Etowah River Watershed Visual Mitigation Measures, continued	Commercial/Non-Commercial Thinning			Create Maintain Wildlife Habitat, Restore PETS and Native Communities			Prescribed Burn			Roadside Maintenance			Temporary Road/Skid Trail Construction			Trails Construction, Rehabilitation, Reconstruction		
	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L
TREATMENTS																		
U. Gravel pits and borrow areas are excluded from seen area of visually sensitive travelways and viewing points to the extent possible.										X	X	X	X	X	X			
V. Openings are shaped and oriented to contours and existing vegetation patterns to blend with existing landscape characteristics. Edges are shaped and/or feathered where appropriate. No geometric shapes are used.	X	X	X	X	X	X				X		X				X	X	X
W. Cut and fill slopes are revegetated to the extent possible.	X	X	X	X	X	X				X	X	X	X	X		X	X	X
X. Mowing or bush hogging is accomplished prior to herbicide treatment.										X								
Y. Provide a range of stem diameters but favor 14 inch and larger stems in a mixture with other smaller sized tree stems.	X																	
Z. Introduce or favor native wildflowers and/or shrubs and/or trees with showy flowers and/or fruits.										X						X	X	
AA. Impacts to forest trails will be minimized. Trail-related mitigations can include all or portions of the following: temporary road and/or skid trail crossings across designated Forest trails should be kept to a minimum. Any crossings should be perpendicular to designated Forest trails. Using segments of designated forest trails as skid trails/haul roads should be avoided, if possible. If trails are used as skid trails/haul roads, specify trail cleanup/rehabilitation at the end of the contract. Trail width should not be increased. Retain character trees and trees that define the trail corridor. Minimize changes to trail alignment and surfacing; do not straighten the trail or change its surface unless alternate material will enhance trail and protect resource. Place warning signs on all trail access points and along the trail where activities are occurring. When activities are occurring along open trails, treat slash within 100' of the corridor daily.	X	X	X	X	X	X							X	X	X	X	X	X