



United States  
Department of  
Agriculture

Forest  
Service

National Forests in North Carolina  
Pisgah National Forest  
Appalachian Ranger District  
Burnsville Station

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File Code: 1950-1

Date: July 18, 2006

Dear Interested Members of the Public and Forest Users:

Enclosed is information my staff has assembled to date evaluating the Shinwhite Project on the Appalachian Ranger District, Pisgah National Forest. The project is located in Madison and Yancey Counties in the Nolichucky analysis area. Three alternatives have been developed and are currently being analyzed; Alternative A – No Action, Alternative B – Proposed Action, and Alternative C. A decision will be made that selects one of these alternatives or a modification of one. While Alternative C has been identified as the preferred alternative, a final decision has not been made yet. I am seeking your input on this EA before I reach a decision.

In accordance with 36 CFR 215.6(a)(3), individuals or organizations wishing to be eligible to appeal must provide the following information: 1) Your name and address; 2) Title of the Proposed Action; 3) Specific substantive comments (215.2) on the proposed action, along with supporting reasons that the Responsible Official should consider in reaching a decision; and 4) Your signature or other means of identification verification. For organizations, a signature or other means of identification verification must be provided for the individual authorized to represent your organization.

In accordance with 36 CFR 215.6(2)(4), comments must be postmarked or received within 30 days beginning the day after publication of this notice in *The Asheville Citizen-Times*. Oral or hand-delivered comments must be received within our normal business hours of 8:00 a.m. to 4:30 p.m. Comments may be mailed electronically, in a common digital format, to: [comments-southern-north-carolina-pisgah-appalachian@fs.fed.us](mailto:comments-southern-north-carolina-pisgah-appalachian@fs.fed.us); regular mail to: Appalachian Ranger District, Attn: District Ranger, PO Box 128, Burnsville, NC 28714; or faxed to 828-682-9179.

Please contact Michael Hutchins, Interdisciplinary Team Leader at 828-682-6146, or Linda Randolph, Project Leader at 828-622-3202 if you have questions concerning this proposal. Thank you for your continued interest in management of the National Forests in North Carolina.

Sincerely,

/s/ *PL Bradley*

PAUL L. BRADLEY  
District Ranger

Enclosure





United States  
Department  
of  
Agriculture

Forest  
Service

July  
2006



# Environmental Assessment

## Shinwhite Project

**Appalachian Ranger District, Pisgah National Forest  
Mitchell & Yancey Counties, North Carolina**

# Shinwhite Project

## Environmental Assessment

Location of Action: Appalachian Ranger District  
Pisgah National Forest  
Mitchell & Yancey Counties, North Carolina

Lead Agency: USDA Forest Service

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# CHAPTER 1 – PURPOSE AND NEED

## 1.1 Document Structure

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

- ◇ *Chapter 1 – Purpose and Need:* This section includes information on the history of the project proposal, the purpose of and need for the project, and the agency’s proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal.
- ◇ *Chapter 2 – Alternatives:* This section provides a detailed description of alternative methods for achieving the stated purpose as well as the No-action Alternative. These alternatives were developed based on significant issues raised by the public and other agencies. This discussion also includes project design features. This section also provides a summary of the environmental consequences associated with each alternative.
- ◇ *Chapter 3 – Environmental Consequences:* This section describes the environmental effects of implementing the proposed action and other alternatives. This analysis is organized by issues. Within each section, the affected environment is described first, followed by the effects of the No-action Alternative that provides a baseline for evaluation and comparison of the other alternatives that follow.
- ◇ *Chapter 4 – Preparers and Public Involvement:* This section provides a list of preparers and members of the public consulted during the development of the environmental assessment.
- ◇ *Appendices:* The appendices provide more detailed information to support the analyses presented in the EA.

### 1.1.1 Project Record

This EA incorporates by reference (40 CFR 1502.21) the project record. The project record contains specialist reports and other technical documentation used to support the analysis and conclusions in this EA. The specialist reports provide additional detailed analysis. This EA incorporates by reference the Nantahala and Pisgah Management Indicator Species (MIS) Report. This report along with Monitoring and Evaluation Reports for the National Forests in North Carolina contains the most current information about forest population trends for MIS species.

## 1.2 Background

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The proposal is located in the 9,709 acre Nolichucky Forest Plan Analysis Area (AA) 7 (see vicinity map at the end of the EA) and within Compartments 65, 68, 69, and 70. The Forest Plan AA may be a different geographic boundary from the AAs individual resources analyze effects to—analysis, project, and activity areas are defined at the end of Appendix A, Biological Evaluation. The Forest Plan AA contains several management areas (MAs), each of which has unique goals and appropriate management direction and standards to achieve these goals as described in the Land and Resource Management Plan, Amendment 5 for the Nantahala and

Pisgah National Forests North Carolina (1994), hereafter called the Forest Plan (Forest Plan, pages III-54 – III-56). The following MAs are within the Forest Plan AA: 2C, 3B, 4C, 5, 12, 14, and 18; however, management is only proposed within (1) MA 3B (emphasis on a sustainable timber supply; Forest Plan, page III-71); and (2) MA 18 (riparian areas; Forest Plan, page III-179).

This preliminary analysis tiers to the Final Environmental Impact Statement (FEIS) for the Forest Plan and to the FEIS for Vegetation Management in the Appalachian Mountains (VMAM).

### 1.3 Proposed Action

This alternative was developed to meet the Purpose and Need. Maps of this alternative are located at the end of the EA.

The following table summarizes harvest-related information for the Proposed Action:

**Table 1-1: Shinwhite Proposed Action (Alternative B)**

Stand	Acres	Prescription	Basal Area	Logging System	Temp Road
65-1	28	Two-age Regeneration	20-25	Tractor	0
65-3	35	Two-age Regeneration	20-25	Tractor	0
65-6	29	Two-age Regeneration	20-25	Tractor	0
68-5	21	Two-age Regeneration	20-25	Tractor	0
69-5	23	Two-age Regeneration	20-25	Tractor	0
70-8	14	Two-age Regeneration	20-25	Tractor	0.1 mi
70-9	36	Two-age Regeneration	20-25	Tractor	0
<b>Total Harvest</b>	<b>186</b>				

- Use and maintain the existing road and skid trail system;
- Site preparation and the subsequent release, if needed with herbicide (Triclopyr) in all stands;
- Designate 70 acres of small patch old growth in compartment 65 and 54 acres of small patch old growth in compartment 68 (both designations are from the initial old growth inventory);
- Within existing wildlife fields containing fescue, use Imazapic herbicide to eradicate fescue component then refurbish the fields by using a clover/warm season grass mix, lime, and fertilizer. Within all existing fields control other non-native invasive plants and daylight around existing fields to develop a brushy interface. Existing fruit trees in wildlife openings would be “released” and autumn olive would be eliminated in all existing fields and replaced with native soft mast species (i.e., spicebush, serviceberry, and/or dogwood). All landings constructed for harvest activities would be seeded following harvest with a clover and wildflower seed mix and on smaller landings, an old variety species of apple or other fruit trees would be planted. Develop two new wildlife fields near Beauty Spot (about 4 acres) that meet scenery standards. Daylight an average of 30 feet either side of Forest Service Roads (FSRs) 5572 and 5506, and Lewis Trail for about 3.5 miles (about 25 acres). Daylight the following existing wildlife fields; Bearwoods, Lewis Trail, Devil’s Fork Gap, White Oak Creek, Annie’s Cove, Beauty Spot (NCWRC), Chestnut Mountain. Daylighting would not occur within existing harvest units and stream protection zones;
- Use herbicides (Triclopyr and Glyphosate) to control non-native invasive plants along Forest Service roads, trails, and historic routes within the AA. Prior to harvest, treat non-native

invasive plants within harvest stands with herbicides (Triclopyr and Glyphosate) or manually; and

- Implement a soil and water improvement project by rehabilitating damaged areas or rehabilitating and relocating away from damaged areas caused by equestrian use.

## 1.4 Purpose and Need for Action

The purpose of this proposal is to meet Forest Plan direction by:

- Balancing age-class distribution;
- Improving timber stand conditions and providing for a continuous supply of timber;
- Reducing competition and improving species composition in proposed harvest units through herbicide use;
- Controlling non-native invasive species through herbicide use along existing roads and trails, and historical routes;
- Improving conditions for wildlife by creating a diversity of habitat and maintaining and enhancing existing fields; and
- Improving water quality by rehabilitating or relocating away from areas of resource damage caused by equestrian use.

### 1.4.1 Why Here, Why Now?

The existing condition of the Shinwhite area has been evaluated and compared against the desired future condition for the area as described in the Forest Plan. Where resources in the area are found to be outside the desired future condition, opportunities for moving the resources towards the desired future condition exist. The Shinwhite area was chosen at this time for vegetation management over other areas on the Appalachian Ranger District because of its planned order of entry in the *Nantahala and Pisgah National Forests, A Schedule of Entry By Analysis Area*. Forest Plan standards schedule to revisit each compartment in MA 4A every 10-15 years to meet early succession habitat standards (Forest Plan, page III-85).

The following table displays the last appreciable entries in the activity areas:

**Table 1-2: Past Harvest in the Shinwhite Project Area**

Sale Name	Compartments	Year	Acres Cut
Broad Hollow	66, 67, 68	1984-1986	154
Chestnut Mountain	70	1986-1988	70
White Oak Flats	54, 64, 65	1993-1995	65
Sunshine	68, 70	1995-1998	98

## 1.5 Decision Framework

Based on the analysis disclosed in this EA, the Responsible Official will make a decision and document it in a Decision Notice and Finding of No Significant Impact. The Responsible Official can:

- Select an action alternative that has been considered in detail, or
- Select a modified action alternative, or
- Select the No-action Alternative.

## 1.6 Public Involvement

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The proposal was listed in the January and April 2006 editions of the Schedule of Proposed Actions (SOPA). The proposal was provided to the public, agencies, and organizations for comment during scoping from December 9, 2005, thru January 9, 2006—fourteen individual comments were received during scoping and a petition was submitted by 32 local residents opposed to the proposal. On February 21, 2006, members of the Appalachian Trail Conservancy and the Tennessee Eastman Hiking Club met in the field with Forest Service employees to discuss the proposal and potential effects to the Appalachian Trail. On June 19, 2006, Forest Service employees met with landowner's who own property adjacent to the project area to discuss aspects of the proposal.

Using comments received from the public, agencies, and organizations during this period as well as internal review, the interdisciplinary team (IDT) developed a list of issues to address.

## 1.7 Issues

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Issues are defined as a point of discussion, debate, or dispute about environmental effects. Issues are used to develop alternatives, mitigation measures, or analyze environmental effects. The Forest Service separated issues into two groups: significant and other. All comments received during scoping have been reviewed and a determination on significance was made. The issue tracking sheet in the project record lists each comment received and the determination of significance.

### 1.7.1 Significant Issue

**1.7.1.1 Significant Issue #1: Age-class Distribution** *Timber harvest and associated activities that increases early successional harvest may adversely impact resources in the area*

**Indicators**

- ◇ Acres of two-age harvest
- ◇ Miles of temporary roads

### 1.7.2 Other Issues

- |   |   |
|---|---|
| <b>1.7.2.1 Herbicide Use</b> –                | <i>Herbicide use may adversely impact wildlife, aquatic, botanical resources, and humans</i>  |
| <b>1.7.2.2 Cultural Resources</b> –           | <i>Harvest related activities may adversely impact cultural sites</i>   |
| <b>1.7.2.3 Soil Resource</b> –                | <i>Harvest related activities may adversely impact soils</i>  |
| <b>1.7.2.4 Botanical Resource</b> –           | <i>Harvest related activities may have adverse impacts to threatened, endangered, sensitive, Forest Concern, and Management Indicator botanical species</i> |
| <b>1.7.2.5 Scenic Resources</b> –             | <i>Harvest related activities may adversely impact scenic resources</i>   |
| <b>1.7.2.6 Non-timber Related Economics</b> – | <i>Harvest related activities may adversely impact non-timber related markets (see also Appendix E)</i>   |

- 1.7.2.7 Wildlife Resource –** *Harvest related activities may adversely impact threatened, endangered, sensitive, Forest Concern, and Management Indicator wildlife species*
- 1.7.2.8 Water Quality and Aquatic Resources –** *Reconstructing roads and harvest-related activities may adversely impact threatened, endangered, sensitive, Forest Concern, and Management Indicator aquatic species*
- 1.7.2.9 Invasive Exotics –** *Management activities may increase infestation of invasive exotic plants*
- 1.7.2.10 Public Safety & Access Management –** *Management activities may decrease public safety and hinder public access into the White Oaks area*
- 1.7.2.11 Other Areas of Concern –** *Harvest activities may adversely affect park lands, prime farmlands, wetlands, wild and scenic rivers, ecologically critical areas, or local law or requirements imposed for the protection of the environment.*

## CHAPTER 2 - ALTERNATIVES

Chapter 2 is the “heart” of an EA (40 CFR 1502.14) and describes alternatives the agency considered in addition to the proposed action. This chapter compares each alternative considered in detail and lists project design features.

### 2.1 Range of Alternatives

The range of alternatives developed and analyzed by the interdisciplinary team (IDT) was driven by the purpose and need underlying the proposal (Chapter 1, Section 1.4), and by the significant issues responding to the proposal. An alternative should (1) reasonably respond to the purpose and need, and (2) address one or more significant issue. The only exception is the No Action Alternative, which is required by regulation [40 CFR 1502.14(d)].

The IDT considered five alternatives. Following internal review, three alternatives were considered in detail and two were eliminated from consideration.

### 2.2 Alternatives Considered in Detail

Three alternatives were developed by the IDT in response to the issues and concerns regarding the proposal; Alternative A – No Action, Alternative B – Proposed Action, and Alternative C. The action alternatives fulfill the specific purpose and need for these actions. Project design features for activities in each action alternative are also described in this chapter.

#### 2.2.1 Alternative A – No Action

Under this alternative the actions described in the proposed action (Chapter 1, Section 1.3) would not be accomplished. No management actions would take place at this time to improve the existing condition of the environment in the project area. There would be no regeneration or timber stand improvements, treatment of non-native invasive species, designation of small patch old growth, or wildlife or aquatic habitat improvements made. This alternative serves as the environmental baseline for analysis of effects.

#### 2.2.2 Alternative B – Proposed Action

A complete description of the Proposed Action can be found in Section 1.3, Chapter 1 above.

#### 2.2.3 Alternative C

Alternative C responds to public comments on the Proposed Action and proposes to:

**Table 2-1: Alternative C**

Stand	Acres	Prescription	Basal Area	Logging System	Temp Road
65-1	28	Two-age Regeneration	20-25	Tractor	0
65-6	29	Two-age Regeneration	20-25	Tractor	0
69-5	23	Two-age Regeneration	20-25	Tractor	0
70-9	23	Two-age Regeneration	20-25	Tractor	0
<b>Total Harvest</b>	<b>103</b>				

- Use and maintain the existing road and skid trail system;
- Site preparation and the subsequent release, if needed with herbicide (Triclopyr) in all stands;
- Designate 70 acres of small patch old growth in compartment 65 and 54 acres of small patch old growth in compartment 68 (both designations are from the initial old growth inventory);
- Within existing wildlife fields containing fescue, use Imazapic herbicide to eradicate fescue component then refurbish the fields by using a clover/warm season grass mix, lime, and fertilizer. Within all existing fields control other non-native invasive plants and daylight around existing fields to develop a brushy interface. Existing fruit trees in wildlife openings would be “released” and autumn olive would be eliminated in all existing fields and replaced with native soft mast species (i.e., spicebush, serviceberry, and/or dogwood). All landings constructed for harvest activities would be seeded following harvest with a clover and wildflower seed mix and on smaller landings, an old variety species of apple or other fruit trees would be planted. Develop two new wildlife fields near Beauty Spot (about 4 acres) that meet scenery standards. Daylight an average of 30 feet either side of Forest Service Roads (FSRs) 5572 and 5506, and Lewis Trail for about 3.5 miles (about 25 acres). Daylight the following existing wildlife fields; Bearwoods, Lewis Trail, Devil’s Fork Gap, White Oak Creek, Annie’s Cove, Beauty Spot (NCWRC), and Chestnut Mountain. Daylighting would not occur within existing harvest units and stream protection zones;
- Use herbicides (Triclopyr and Glyphosate) to control non-native invasive plants along Forest Service roads, trails, and historic routes within the AA. Prior to harvest, treat non-native invasive plants within harvest stands with herbicides (Triclopyr and Glyphosate) or manually; and
- Implement a soil and water improvement project by rehabilitating damaged areas or rehabilitating and relocating away from damaged areas caused by equestrian use.

## 2.3 Alternatives Considered but Eliminated from Detailed Study \_\_\_\_\_

As per 40 CFR 1502.14(a), the following alternatives were considered but eliminated from detailed study:

### 2.3.1 Alternative 1 – Watershed Enhancement without Harvesting

This alternative focused on an ecosystem restoration proposal without commercial timber harvest. Wildlife habitat improvement, stream improvement/restoration, and control of invasive exotic plants would still occur. This alternative was dropped from detailed study because harvesting is necessary to meet the Purpose and Need and is not consistent with Forest Plan standards and guidelines for Management Area 3B (Standard 1a and General Direction 2, Forest Plan, page III-75). This alternative does not manage to emphasize quality hardwood sawtimber, nor is it reasonable to assume that funding would be available to accomplish the wildlife improvement projects. A “cut and leave” treatment to accomplish regeneration objectives would not emphasize a sustainable supply of timber (Forest Plan, pages III-6, III-55, and III-71). Portions of this alternative are also met with Alternative A – No Action.

### 2.3.2 Alternative 2 – Harvest in the Flat Top Area and Construct Road to Lost Cove

This alternative was identified following public review of the proposal. Some members of the public were concerned with the proposal to log in the White Oaks area and requested harvesting be shifted towards the Lost Cove area. They believed this would allow the Lost Cove area to be roaded, providing future opportunities for the public, the Forest Service, and logging contractors as well as assuring safety to members of the public that live in the White Oaks area. This alternative was considered but eliminated from detailed study because it would cause adverse impacts to the eligible Nolichucky Wild and Scenic River corridor.

## 2.4 Project Design Features Common to Action Alternatives \_\_\_\_\_

The action alternatives share these project design features and would become mandatory if the responsible official selects an action alternative for implementation (see also Section 3.7, Chapter 3 for specific scenery project design features, and Appendices A and F).

- To reduce the possible effect of invasive exotic plant species to this proposal, all known populations of *Miscanthus sinensis*, *Paulownia tomentosa*, and *Ailanthus altissima* should be controlled prior to disturbance activities. *Miscanthus sinensis* was found along Forest Service Roads. All populations total less than 1 acre. Control *Microstegium vinineum* along roads adjacent to harvested stands. Control of *Microstegium vinineum*, *Miscanthus sinensis*, *Paulownia tomentosa* and *Ailanthus altissima* is best done by the use of herbicide (Glyphosphate).
- Trees accidentally felled across stream channels (that prevent or block stream flow) would be lifted (when possible) away from the water. If this is not possible, each tree would be pulled away from the water where it fell and temporary decking would be used to support the weight of the tree as it is pulled across the channel. These removals would be perpendicular to the stream channel whenever possible to minimize stream bank disturbance. Bare soil would be seeded and mulched if native vegetation does not start to recolonize the area by the time timber removal from the unit is complete.
- Skid roads should avoid stream crossings and paralleling perennial channels within designated riparian areas.
- Landings and skid trails should be vegetated as soon as possible after use to avoid off-site soil movement.
- Temporary roads (if needed) would be constructed to avoid runoff into area streams. In addition, silt fence, straw bales, or brush barriers would be placed along the length of the road where it parallels or crosses a stream as needed to control runoff and stream sedimentation.
- National objectives include reducing impacts from invasive species and to improve the effectiveness of treating selected invasive species on the Nation's forests and grasslands. Survey area would be established to monitor control efforts, and checked during treatment and within nine months after treatment. A post-treatment evaluation report would be completed and filed in the project file.

## 2.5 Summary Comparison of Actions by Alternative \_\_\_\_\_

The following table summarizes management activities within each of the alternatives:

**Table 2-2: Management Activities by Alternative**

Activity	Alternative <sup>1</sup>		
	A	B	C
Regeneration harvest	0	186	103
Site preparation with Triclopyr (if needed)	0	186	103
Designate small patch old growth in Compartments 65 and 68	0	124	124
New temporary road construction between stands 70-8 & 70-9 (miles)	0	0.1	0
Develop two new wildlife fields near Beauty Spot	0	4	4
Daylight 30 feet either side of FSRs 5572, 5506, and Lewis Trail (about 3.5 miles)	0	25	25
Use Imazapic herbicide to eradicate fescue component within existing wildlife fields then refurbish them by using a clover/warm season grass mix, lime, and fertilizer?	No	Yes	Yes
Seed constructed landings following harvest with a clover and wildflower seed mix and on smaller landings, plant an old variety species of apple or other fruit trees?	No	Yes	Yes
Release existing fruit trees in wildlife openings and eliminate autumn olive and replace with a native species (i.e., spicebush, serviceberry, and/or dogwood)?	No	Yes	Yes
Daylight around existing wildlife fields?	No	Yes	Yes
Use herbicides (Triclopyr and Glyphosate) to control non-native invasive plants along Forest Service roads, trails, and historic routes?	No	Yes	Yes
Treat non-native invasive plants within harvest stands with herbicides (Triclopyr and Glyphosate) or manually prior to harvest?	No	Yes	Yes
Rehabilitate areas damaged by equestrian use or rehabilitate and relocate away from damaged areas?	No	Yes	Yes

<sup>1</sup> Measurements are in acres unless otherwise specified

## CHAPTER 3 – ENVIRONMENTAL CONSEQUENCES

Included in this chapter are disclosures of direct, indirect, and cumulative effects of the alternatives on the different resources. Reports from different resource specialists supplied information for portions of the analysis in this chapter. Definitions of specific biological analysis areas (AA) effects are analyzed to are located in Appendix A, Biological Evaluation (BE).

### 3.1 Hydrology and Aquatic Habitat

Additional analysis on aquatic habitat is disclosed in Appendix A, [Biological Evaluation (BE)]; Section 3.8 [Management Indicator Species (MIS)]; Section 3.9 [Threatened, Endangered, Sensitive (TES), and Forest Concern (FC) Species]; and the aquatic resource report, project record. This analysis addresses activity area waters and aquatic biological AA waters. Activity area waters are defined as those in the area of potential site-specific impacts on aquatic habitat and populations. The AA encompasses waters downstream that potentially could be impacted by project activities, in addition to activity area waters. The AA is larger than the activity area.

#### 3.1.1 Existing Condition

Existing data for aquatic resources within the aquatic AA is used to the extent it is relevant to the project proposal. This data exists in two forms: 1) general inventory and monitoring of Forest aquatic resources and 2) data provided by cooperating resource agencies from aquatic resources on or flowing through the Forest. Both of these sources are accurate back to approximately 1980 and are used regularly in project analyses. Data collected prior to 1980 is used sparingly (mostly as a historical reference). Project-specific surveys are conducted to obtain reliable data where none exists.

Substrate within the activity area waters (Table 3-1) was evaluated and visually estimated. The three primary types of substrate that exist were documented at each macroinvertebrate sample site. This information is valuable for determining the amount of habitat available for proposed TES species, MIS, as well as other aquatic organisms.

**Table 3-1: Forest Plan Watershed 22 (Nolichucky River)**

Stream Name (UT denotes an un-named tributary)	Compartment-Stand	Miles in Activity Areas	Miles in AA
Hollow Popular Creek		0	0.8
Nolichucky River		0	5.7
UT1	69-5	0.1	0.6
UT2	69-5	0.3	0.4
UT3		0	1.3
UT3UT1		0	0.2
UT3UT2	65-6	0.1	0.6
UT4	65-3	0.5	1
UT4UT1	65-3	0.3	0.5

Stream Name (UT denotes an un-named tributary)	Compartment-Stand	Miles in Activity Areas	Miles in AA
Shinbone Creek	70-8,9	0.2	2.7
UT1		0	0.9
UT2		0	0.4
UT3		0	0.1
UT4		0	0.9
UT1UT4	68-5	0.03	0.2
UT5	70-9	0.2	0.3
UT6		0	1.1
White Oak Creek		0	2.1
UT1	65-7	0.3	0.5
UT1UT1	65-7	0.2	0.2
<b>Totals</b>		<b>2.43</b>	<b>20.5</b>

### 3.1.1.1 Shinbone Creek

Shinbone Creek runs between compartments 68 and 70 and is adjacent to Stands 70-8 and 70-9. The substrate composition percentages for Shinbone Creek are 25% sand, 28% gravel, 20% cobble, 9% boulders and 18% organic material. Only the lower reaches of Shinbone Creek support habitat for fish populations of rainbow trout and beneficial sites are found for non-game fish spawning from the Nolichucky River. In the upper reaches fish habitat was not found.

There are a total of five un-named tributaries (UT) to Shinbone Creek that were used for monitoring purposes and are adjacent to compartments in the timber sale. UTs 1, 2, and 3 to Shinbone Creek are adjacent to stand 70-9. UT 4 to Shinbone Creek is adjacent to stand 68-5. UT 5 to Shinbone Creek is adjacent to stand 70-8. Average substrate composition percentages for the UTs to Shinbone Creek are 20% sand, 37% gravel, 23% cobble, 5% boulder, and 15% organic material. There is no documented fish habitat found in the UTs to Shinbone Creek within the activity area of the Shinwhite proposal.

### 3.1.1.2 White Oak Creek

White Oak Creek is adjacent to stand 65-1. The substrate composition percentages are 40% sand, 25% gravel, 25% cobble and 10% organic material. There is fish habitat for brown trout and a possibility of non-game fish spawning from the Nolichucky River in the lower reaches.

The UT to White Oak Creek runs through stand 65-1. The substrate composition percentages are 22% sand, 17% gravel, 35% cobble, 13% boulders and 13% organic material. No fish habitat has been documented for UT to White Oak Creek during activity area surveys.

### 3.1.1.3 Nolichucky River

The Nolichucky River is described as being wide and very sandy. Data shows the Nolichucky River as having one threatened species: *Alasmidonta raveneliana* (Appalachian Elktoe); four sensitive species: *Stygobromus carolinensis* (Yancey sideswimmer), *Etheostoma acuticeps* (sharphead darter), *Percina burtoni* (blotchside darter) and *Percina squamata* (olive darter). There are 13 concern species inhabiting the Nolichucky River. The Nolichucky River supports

fish habitat for 32 different species including game and non-game species. In the Shinwhite proposal, stands 65-3 and 65-6 are located approximately 0.5 miles from the Nolichucky River. The UTs to the Nolichucky River are adjacent to stands 65-3 and 65-6. The substrate composition percentages are 20% sand, 50% gravel, and 30% cobble. There is no documented fish habitat found.

Culverts along Forest Service Roads (FSRs) 5570, 5583, and 5565, the roads themselves, the existing ford in White Oak Creek on FSR 5570, and existing old roads and skid trails in the activity area are the existing threats to streams and drainages. Impacts from these sources are limited to down slope movement of sediment from road runoff and culvert fills. The road washing that occurred during the tropical storms fall of 2004 caused and continues to cause off-site movement of soil into the aquatic AA waters. In most cases the majority of sediments from these sources are deposited in natural vegetative filters before they reach areas of perennial streams.

### **3.1.2 Effects Analysis**

Effects are disclosed below for 1) general direct and indirect effects of the alternatives on aquatic resources, 2) direct and indirect effects of access on aquatic resources, 3) direct and indirect effects of timber harvesting on aquatic resources, 4) direct and indirect effects of other activities, and 5) cumulative effects to aquatic resources.

#### **3.1.2.1 General Direct and Indirect Effects of Alternatives on Aquatic Resources**

##### Introduction

Examples of direct effects of a proposed action on aquatic species include, but are not limited to, activities such as crushing individual insects, fish, or redds during stream crossing installation. Such effects are more likely to occur to less mobile aquatic organisms such as aquatic insects, freshwater mussels, and fish eggs and larvae, whereas more mobile species such as crayfish, aquatic salamanders, and juvenile and adult fish are often able to escape direct effects by simply leaving the area. Direct effects may also include changes in the quality, quantity, or diversity of habitat available resulting from sedimentation. It is important to note that effects to aquatic habitats from management activities can be positive or negative, depending on the nature of the proposed actions and site-specific conditions.

Examples of indirect effects of a proposed action on aquatic species include, but are not limited to, altered reproductive or foraging success and increased occurrence of disease as a result of sedimentation, degraded water quality, and altered community structure as a result of migration. Indirect effects may also include changes in the quality, quantity, or diversity of habitat available resulting from changes in riparian vegetation. Specifically, the transport of large woody debris (LWD), an integral component of aquatic habitat diversity, to stream channels is a function of riparian vegetation structure and composition. The Forest Plan does not allow vegetation management within riparian zones for perennial streams unless it is specifically for the enhancement of riparian values (page III-181). This standard was designed to allow vegetation along streams to become old and decadent and to serve as a long-term source of LWD to stream channels. However, areas exist across the Forests where vegetation can be managed within designated riparian areas to facilitate LWD transport and to serve as a short-term source of habitat improvement.

### Alternative A – No Action

There would be no direct or indirect effects as a result of this alternative as no actions are proposed. The existing description as described above would be maintained. Current activities such as general road maintenance, wildlife suppression, and recreation would also continue in the AA.

### Alternatives B & C

Alternatives B and C are primarily discussed together due to the similarity of associated activities with the two action alternatives with the exception of Section 3.1.2.2 Effects of Access on Aquatic Resources. Alternative C proposes the similar types of actions as Alternative B with one clear exception as it relates to the aquatic resources in the area; it would eliminate the need for 0.1 miles of temporary road construction and an associated culvert in an ephemeral drainage between Stands 70-8 and 70-9. All other associated activities are generally the same for Alternatives B and C.

Sedimentation of aquatic habitats within the activity area may occur with the maintenance of existing system roads and skid trails. The construction of 0.1 miles of temporary road between stands 70-8 and 70-9 could cause some off site movement of soil into AA waters if weather conditions are such that sediments could be carried down the ephemeral channel between these two stands. A stream crossing (such as a culvert) would minimize this impact. Sediment loading and turbidity can result in the loss of interstitial habitat within the substrate and cause direct mortality by the crushing or smothering of less mobile organisms such as aquatic invertebrates, fish eggs and juveniles. No existing stream crossings would be replaced.

#### **3.1.2.2 Direct and Indirect Effects of Access on Aquatic Resources**

This discussion assumes all Forest Service timber sale contract clauses, North Carolina Best Management Practices (BMPs), and any other required management practices relating to water quality would be implemented successfully. Should an implemented contract clause or BMP fail during project implementation, immediate corrective action should be taken to reduce impacts to aquatic resources.

### Alternative A

Implementation of the no action alternative would perpetuate the existing condition described above. Aquatic habitat quality, quantity, and populations would continue in their natural dynamic patterns. It is important to note that natural processes include aspects such as extinction of species and loss of habitat types. There would be no impacts upon the one T&E species, four S species, or the 13 FC species.

### Alternative B

**Direct Effects:** Access to proposed unit 70-8 would involve one culvert crossing in a dry ephemeral channel on approximately 0.1 miles of temporary access road. The placement of this culvert would directly impact approximately 22- 24 linear feet of ephemeral channel bottom. Sediment control measures would be implemented at the site to avoid off site movement of soil at the crossing.

Riparian areas have been identified as 100 feet on either side of perennial channels and 30 feet on either side of intermittent channels. No activity, including the placement of log landings and skid trails, would occur in this area with the exception of access at stream crossings.

The road drainage on the 0.1 mile section of temporary road within the activity area would be designed so water flows off the roaded area and enters vegetation rather than directly into activity area streams. Following harvest activities, disc and seeding of all unsurfaced temporary roads, skid roads, and log landings would occur.

**Indirect Effects:** There may be off-site movement of soil into activity area waters from temporary road construction and maintenance of existing system roads. Turbidity and sediment loading can cause mortality by injuring and stressing individuals or smothering eggs and juveniles.

Available habitat, including the interstitial space within substrate used as spawning and rearing areas, may be covered with sediments. Episodic fluctuations in turbidity may occur after soil disturbance ends because sediments deposited within the stream bed may be re-suspended during high flow events (Swank *et al.* 2001). If habitat complexity is lost through sedimentation, a shift in the aquatic insect community could occur that favors tolerant macroinvertebrates. Larger, more mobile aquatic species, such as fish are able to temporarily escape the effects of sedimentation by leaving the disturbed area. Eggs and juveniles may be lost due to reduced habitat or suffocation. This can result in the loss of, or reduced, year-class strength, which can lead to accelerated population fluctuations and suppressed population levels. Over time, these species would recolonize areas as habitat conditions improve.

Smaller, less mobile organisms such as crayfish and aquatic insects may not be able to move to more suitable habitat. Individuals of these species may decline locally or be lost through reduced productivity. These may recolonize from reaches of undisturbed streams as conditions improve with site rehabilitation. Implementation of contract clauses and erosion control precautions described above would minimize sediment effects and accelerate site rehabilitation.

Skid trails and the temporary road construction may also cross ephemeral streams or spring seeps that feed these streams and others in the activity area. If heavy rains occur while these ephemeral crossings are exposed, bare soil can be transported down slope to intermittent and ephemeral stream channels. Temporary stream crossings should be used across ephemeral channels to avoid the potential for sedimentation of down slope aquatic resources. These crossings could include the use of temporary bridges (e.g. simple log stringers or pre-fabricated decking), culverts, or channel armor (e.g. stone or brush).

#### Alternative C

Alternative C eliminates Stand 70-8 and therefore removes the need for a culvert to be placed into an ephemeral channel between stands 70-8 and 70-9. Dropping the temporary road and associated crossing reduces the risk of off-site movement of soil to enter into perennial stream channels but does not eliminate this risk from the entire activity area. Therefore Alternative C reduces the possibility of indirect effects on aquatic habitat. There would also be no direct impact on the 22-24 linear feet of ephemeral channel bottom by the placement of a culvert as these effects would dissipate approximately 50 feet downstream of the construction area and within 1 day.

All other discussion for direct and indirect effects on aquatic resources from access is the same as Alternative B.

### **3.1.2.3 Effects of Timber Harvest on Aquatic Resources, Water Quality, and Riparian Areas**

### Alternative A

The existing condition of aquatic resources as described above would be maintained under this alternative. Natural fluctuations in population stability, and habitat quality and quantity would continue.

### Alternatives B & C

North Carolina Forest Practices Guidelines (NC-FPGs) and Forest Plan standards (BMPs) would be implemented during harvest activities. Applications of Forest Plan standards are intended to meet performance standards of the state regulations. Visible sediment derived from timber harvesting, defined by state regulations, should not occur unless there is a failure of one or more of the applied erosion control practices. Should any practice fail to meet existing regulations, additional practices or the reapplication of existing measures would be implemented as specified by state regulations.

There is no plan to harvest within any 100 foot riparian area of perennial streams within the activity areas. According to Volume 1 of the Final Environmental Impact Statement for the Forest Plan, *Under these conditions, no increase in water temperature is anticipated under any of the alternatives. Since riparian-area treatment is not expected under any alternatives, availability of woody debris would be positively influenced if there was no harvest anywhere within the riparian zone on each streambank* (page IV-36). The only cutting within the riparian areas would be associated with stream crossings discussed above. There is the possibility that as trees are cut, they would cross a stream channel or spring. While large woody debris (LWD) in and adjacent to stream channels is desirable for aquatic habitat diversity, it needs to be of the same scale as the channel size and type. If the scales of the trees and stream channels do not match, there is the possibility that leaving large tree boles in the channels and across springs could result in flow obstruction. This can lead to accelerated bank scouring and failure, and subsequently, sedimentation of local and downstream channels. To avoid the potential for this habitat loss, trees accidentally felled across stream channels or springs would be removed. "Drag lanes" should not be designated for the removal of these trees to avoid severe bank disturbance. Rather, trees should be removed individually, from where they fell. It is unlikely that pulling individual trees across would result in permanent stream bank damage. Any damage done to the stream banks would most likely be temporary (less than one year), as there is an abundance of herbaceous vegetation along the banks that would quickly recolonize bare soil.

Water quality should not be adversely affected as long as Forest Plan standards and NC-FPGs are followed, and timber sale contract clauses are implemented. Stream temperatures would not be affected because adequate shade would be maintained along perennial and intermittent streams. Water quality may improve with project implementation addressing such watershed issues as repairing highly eroded sites currently used as equestrian access. It is planned to move these sites away from streams and rehabilitate existing damaged areas.

#### **3.1.2.4 Direct and Indirect Effects of Other Activities**

### Alternative A

The existing condition of aquatic resources has been described above. Natural fluctuations in population stability, and habitat quality and quantity would continue. It should be noted that the encroachment of exotic invasive species throughout the riparian areas of the aquatic resources

within the area would likely occur as a result of non-treatment, including burning and the use of herbicides (personal communication with USFS Botanist, David Danley 2005).

### Alternatives B & C

**Herbicide Use:** Herbicides are proposed in both action alternatives for the Shinwhite proposal. Herbicides use for silvicultural treatments and their impacts to aquatic resources is analyzed in detail in the Vegetation Management Environmental Impact Statement for the Southern Appalachians (VMEIS). Included in this document is a detailed analysis of the effects of silvicultural treatments on aquatic resources. Please refer to this document for a description of such effects. No herbicide would be used in the 30 feet of any perennial streams within the Shinwhite proposal. No herbicide would be sprayed within the 30 foot designated riparian area of any intermittent streams within the activity area. If oriental bittersweet is discovered during harvest activities, hand pulling may occur within these 30 feet to prevent the elimination of native riparian vegetation. No pulling would occur on stream banks to prevent erosion.

**Watershed restoration:** Both Alternative B and Alternative C propose to address erosion issues associated with the equestrian use in the Shinbone area of the Shinwhite project area. This work would improve water quality within the area by removing trails from riparian areas and rehabilitating them so that they are returned to a more natural state. Rehab work would initially cause some indirect effects due to disturbance within riparian areas of some unnamed tributaries to Shinbone Creek but would cease with seeding and site recovery. Erosion control practices would be implemented during the decommissioning process to avoid off-site movement of soil into the aquatic analysis area waters. There would be no direct effects to the aquatic resources as a result of this watershed work. Long term benefits would outweigh any short term impacts of the watershed work for the Shinwhite proposal.

The following table summarizes potential effects to aquatic resources by alternative:

**Table 3.2: Summary of Potential Effects to Aquatic Resources by Alternative**

Issue	Alternative A	Alternative B	Alternative C
Effects on aquatic MIS	Existing habitat and population trends continue	Existing habitat may improve with watershed restoration work in the Shinbone area. Existing populations and trends would continue.	Existing habitat may improve with watershed restoration work in the Shinbone area. Existing populations and trends would continue.
Effects on water quality (Associated with the amount of soil disturbance)	Slight risk of degradation from erosion issues associated with equestrian use in the Shinbone area	Turbidity and sediment is unlikely to occur as a result of this project. The risk slightly increases with Alternative B due to the placement of one culvert in an ephemeral channel between Stands 70-8 and 70-9. Any movement of soil should be deposited into the vegetation of the channel before reaching surface waters. Risk would cease with site rehabilitation.	Turbidity and sediment is unlikely to occur as a result of this project.
Effects on aquatic habitat and	Existing habitat and population trends	Unlikely that any negative impact to aquatic habitat or	Unlikely that any negative impact to aquatic habitat or

Issue	Alternative A	Alternative B	Alternative C
populations	continue	populations would occur. Habitat may improve with the watershed restoration work.	populations would occur. Habitat may improve with the watershed restoration work.
Effects to riparian areas	Remain in present state. Aquatic habitat would improve, as riparian areas grow older	Remain in present state. Aquatic habitat would improve, as riparian areas grow older, increasing large woody debris in streams.	Remain in present state. Aquatic habitat would improve, as riparian areas grow older, increasing large woody debris in streams.
Effects of herbicide	No treatment could cause the replacement of native riparian vegetation with exotics	No impact as no spraying would occur within 30 horizontal feet of streams.	No impact as no spraying would occur within 30 horizontal feet of streams.
Effects of wildlife habitat enhancement work	Existing condition would continue	No impact to aquatic resources as no wildlife enhancement activities would occur inside the 100 foot riparian area of activity or AA streams.	No impact to aquatic resources as no wildlife enhancement activities would occur inside the 100 foot riparian area of activity or AA streams.
Effects of watershed enhancement work	No treatment of the existing condition could cause degradation of habitat within unnamed tributaries to Shinbone Creek	Temporary impacts could occur as a result of decommissioning however, long term benefits would outweigh any short term impacts.	Temporary impacts could occur as a result of decommissioning however, long term benefits would outweigh any short term impacts.

### 3.1.2.5 Cumulative Effects to Aquatic Resources

The cumulative effects to potential habitat are those of past actions, current and foreseeable actions within the aquatic analysis area that have directly or indirectly effected any proposed, endangered, threatened, sensitive (PETS) and Forest concern (FC) aquatic species potential habitat

#### Alternatives A, B, & C

Past Actions analyzed include: Timber Harvest: Murphy Timber (private) sale (2006), White Oak Timber Sale (1992), Sunshine/ Bowling Green Timber Sale (1998), Flat Top control burn (2004), Bowling Green control burn (2002), Unnamed burn (1997) and storm repair work along FSR 5570. The equestrian use is also considered as a source of impact to the existing condition of the aquatic resources in the Shinwhite Timber Sale area. Another action that occurs within the area that contributes to cumulative effects is the maintenance of the railroad right-of-way by CSX Railroad.

Remnants of past timber activities where access was associated with the projects are in many cases on-going contributors to negative impacts to aquatic resources. Within the Shinwhite area, the ford that crosses White Oak Creek causes discontinuity of habitat for aquatic organisms and a barrier to for most non-game fish species and aquatic macroinvertebrates. Petroleum products and other pollutants from vehicles can cause degradation of water quality downstream of fords. Also contributing to the cumulative impacts within the activity area is the equestrian use causing riparian damage along unnamed tributaries to Shinbone Creek. With a new activity within the area, solutions to these types of problems are addressed with the project proposal. There is no plan to address the ford with this proposal; however, this site would be looked at more closely

for restoration of native brook trout above the ford. The equestrian use would be addressed with either of the action alternatives of the Shinwhite Project.

Within the Shinwhite AA, no undersized culverts have been identified that are associated with previous timber sale access. There are no apparent negative impacts contributing to problems from past timber projects. There are areas within this project that riparian areas have historically been heavily harvested. However, as these areas continue to grow older, conditions should improve as large woody debris input into analysis area streams returns to a more natural state.

Prescribed burning usually occurs in the late winter to early spring season. These are usually low intensity burns, which do not destroy enough of the soil layer to produce large amounts of ash. Riparian areas are generally moist enough that the fire would burn out and riparian vegetation would not be destroyed. Fires generally do not burn through the riparian areas to the edge of streams. This provides buffer areas large enough to filter any off-site movement of ash. There is a slight risk that nutrient input increases through groundwater in area waters from the burned areas. These impacts are short-term would not contribute to negative cumulative impacts to aquatic resources.

Two tropical storms moved through the project and analysis areas during September of 2004 during an 8 day period. These storms released up to 14 inches of rain within 48 hours each time. Many streams within the French Broad River drainage were heavily impacted by the storm events. Streams within the Shinwhite Activity area were affected by the storm events. As observed in other watersheds across the Pisgah National Forest, these large storms (100 year floods or greater) often act as a “restart mechanism” for cumulative effects. Substrates in the upper reaches of White Oak Creek has been cleaned or washed out, creating habitat for aquatic organisms which rely on interstitial space (the space between substrate particles). This phenomenon does not seem to hold true for the unnamed tributaries of Shinbone Creek. It is likely that the continued equestrian use after the storms of 2004 have negotiated any positive impacts that might have occurred as a result of the storms. Currently there is a lack of interstitial space in these unnamed tributaries to Shinbone Creek. Interstitial space is especially important for trout species which spawn over clean substrates that allow for oxygen to reach the eggs and juveniles.

CSX Railroad has been reprimanded several times for illegal spraying of herbicides along their right-of-way along the Nolichucky River and for wastes being dumped on National Forest lands. The problem appears to be improving however monitoring of this activity is difficult along the Nolichucky gorge. Although the impacts from their activity have not been linked to specific damages to water quality, it is suspected that some impacts have occurred to the Nolichucky River as a result of this activity. It is not expected that any activities associated with the Shinwhite Project would cause cumulative effects to aquatic activity and analysis area waters.

As a result, the expected cumulative effects should not be any greater than the direct and indirect effects disclosed above and there should be no adverse cumulative effects to the aquatic AA resources, based on the project’s design features included in this analysis.

The following table displays past, present, and reasonably foreseeable future actions within and near the Shinwhite AA that would be accounted for in cumulative effects as appropriate by resource analysis:

**Table 3-3: Past, Present, and Reasonably Foreseeable Future Actions within and near the Shinwhite AA**

Action	Description
<b>Rx Fire</b>	Beauty Spot – 500 acres (scheduled for 2008)
	Flat Top – 1,560 acres (burned in 2004, scheduled for 2007 and 2009)
	Bowling Green – 650 acres (burned in 1998 and 2002, scheduled for 2006)
	45 acre burn in 1997 near proposed old growth in Compartment 68
<b>Timber</b>	Broad Hollow – 154 acres harvested in 1984-1986 in Compartments 66, 67, and 68
	Bowling Green – 98 acres harvested in 1989-1999 in Compartments 71, 73, and 74
	Chestnut Mountain – 55 acres harvested in 1986-1988 in Compartment 70
	Devil's Creek – 173 acres in 1986-1988 in Compartments 55, 56, and 57
	White Oak Flats – 135 acres in 1993-1995 in Compartments 54, 64, and 65
	Sunshine – 95 acres in 1995-1998 in Compartments 68 and 70
	Hemlock Woolly Adelgid – 8 conservation areas (4 release, 4 release and inject). 2005: 2,000 beetles released and 2006: 4 injections and 1,000 beetles
50 acre private timber sale near 65-3 in 2006	
<b>TSI</b>	Silviculture EA – 2004 treatments in the Flat Top area in stands 58-1, 60-8, and 62-15 (87 acres)
	Silviculture EA – 2005 treatments in the Nolichucky area in stands 68-12, 68-13, and 70-4 (99 acres)
<b>Roads</b>	Storm maintenance/repairs on FSR 5570 White Oak Flats Road and FSR 278 Flat Top Road (subject to funding)
<b>Trails</b>	AT – meet onsite with ATC/Erik C in Feb
	Trail to Lost Cove – hiking with some unauthorized ORV use
<b>Recreation</b>	Dispersed hunting camps adjacent/on wildlife fields
	Poplar Boat Launch
	Nolichucky Wild and Scenic River
<b>Watershed</b>	Nothing
<b>Special Uses</b>	Powerline R-O-W
	AT Guiding
	Yearly wagon trips on Flat Top road
	Guiding on the Nolichucky (rafting/fishing)
<b>Wildlife</b>	Annual Field Maintenance
	Forest-wide Wildlife/Invasive EA
	Flat Top Fields EA in 2001 and 2002
<b>Private Lands</b>	Lost Cove
	CSX Railroad

### 3.2 Wildlife

Additional analysis on wildlife habitat is disclosed in Appendix A, BE; Section 3.8 (MIS); Section 3.9 (TES & FC); and the wildlife resource report, project record. The wildlife biological analysis area (AA) is the Nolichucky Forest Plan AA (about 9,709 total acres). The following tables display forest type and habitat, and age-class information:

**Table 3-4: Existing Forest Types within the Shinwhite AA**

Species/Forest Type	Acres (CISC)	% of AA	Alt B Ac/%	Alt C Ac/%
White Pine	190 ac	2%		
White Pine - Hemlock	43 ac	<1%		
Red Spruce - Fraser Fir	67 ac	<1%		
Hemlock – Hardwood	194 ac	2%		
White Pine – Cove Hardwood	43 ac	<1%		
White Pine – Upland Hardwood	539 ac	5.5%	23/4%	23/4%
Pitch Pine - oak	856 ac	9%		
Pitch Pine	116 ac	1%		
Cove Hardwood – White Pine – Hemlock	<sup>1/</sup> 336 ac	3.5%		
Upland Hardwood – White Pine	<sup>1/</sup> 312 ac	3%	25/8%	2/<1%
Scarlet and Chestnut oak -Yellow Pine	<sup>1/</sup> 79 ac	1%		
Yellow Poplar	304 ac	3%		
White Oak – N. Red Oak – Hickory	<sup>2/</sup> 2,752 ac	28%	2/<1%	2/<1%
Yellow Poplar – White Oak – Red Oak	<sup>2/</sup> 2,333 ac	24%	183/8%	121/5%
Chestnut Oak	<sup>2/</sup> 226 ac	2%		
Chestnut Oak - Scarlet Oak	<sup>2/</sup> 387 ac	4%		
Scarlet Oak - Chestnut Oak	<sup>2/</sup> 1,048 ac	11%		
<b>Total</b>	<b><sup>3/</sup>9,825</b>	<b>100 %</b>	<b>233 ac/2.3%</b>	<b>148 ac/1.5%</b>

<sup>1/</sup> Medium level hard mast = 3,060 acres

<sup>2/</sup> High level hard mast = 4,413 acres

<sup>3/</sup> Total 10,912 acres includes 106 ac wildlife openings and 981 acres which includes; roads, river, land class 900 or 800

**Table 3-5: Age Class Representation and Proposed Changes by Alternative**

Age Class – Habitat Vegetation Component	Acres (CISC)	Percentage of AA	Alt A	Alt B Ac/% chg	Alt C Ac/% chg
0-10 age – Early Successional <sup>2/</sup>	145 ac	1.5%	Decrease as of 2008	+229/2%	+144/1%
11-20 age – Early Successional	348 ac	4 %			
21-50 age – Mid Successional	192 ac	2%			
51-100 age – Mature Forest	6,803 ac	69%	No change	-274/3%	-195/2%
101-140 age – Old Forest	2,207 ac	23%			
<b>Total</b>	<b>9,825 ac</b>	<b>99.5%</b>			
Grass/forb habitat	106 ac	1%	4 ac	+4 ac	+4 ac
<sup>1/</sup> Open road - mi/mi <sup>2</sup>	<b>0.2 mi/mi<sup>2</sup></b>				

<sup>1/</sup> Includes state and private roads

<sup>2/</sup> Daylighting of linear and open grass/forb habitat included

### 3.2.1 Alternative A

Under this alternative, the early successional habitat (0-20 years) would remain at about 500 acres, or about four percent of the wildlife AA; the grass/forb openings would remain at <1 percent—both of which currently do not meet required Forest Plan minimum standards (Forest Plan, page III-23); and habitat connectivity would be maintained. No development of 0-10 year age class today would mean this age-class would begin to decrease beginning in 2008 (last entry was in 1998) and the other age-classes would subsequently be affected as time goes on. There would be no adverse cumulative effects with this alternative when combined with other activities listed in Table 3-3 above.

## 3.2.2 Alternatives B & C

### 3.2.2.1 US Fish and Wildlife Service Bird Species of Concern

The U.S. Fish & Wildlife Service (FWS) has listed bird species of conservation concern within this region. The worm-eating warbler was recorded during bird surveys to occur within the unit 70-9.

#### Worm-eating Warbler

The FWS listed the worm-eating warbler as not a priority species for conservation need due to high populations recorded within the region. Partners-in-Flight identifies this species as one to consider dropping from the concern list and is not of local conservation interest.

The worm-eating warbler is often found in steep areas with a thick rhododendron and laurel shrub layer. Stand 70-9 exhibits thick rhododendron and dog hobble and borders a riparian area on the west side of the unit. West of this riparian area is a large block of mature forest that would not be adversely affected by any alternative in this proposal. Forest Interior Patch #28 is within this AA and it would not be affected by any alternative in this proposal. Therefore, the majority of habitat within the AA that is considered important for the worm-eating warbler would not be adversely affected.

Recent research (Vitz 2006) found worm-eating warblers were utilizing the interior of clearcuts from 10-22 acres in size during post-breeding. This research tested several widely held theories regarding mature forest or forest interior bird guilds and concluded that a mosaic of successional stages holds the greatest promise for this bird guild.

## 3.3 Botanical

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It is expected that there would be a temporary increase of ruderal (weedy) species of plants within the activity areas. These species are often prevalent during the initial stages of succession and decrease with age. This is particularly true near constructed roads and log landings. A high percentage of these ruderal species are non-native. There are 124 species of non-native plant species documented to occur on the Pisgah and Nantahala National Forests (Danley and Kauffman). An increase of non-native plant species in the proposed activity area is expected. Many of these species, both native and non-native, have benefits for wildlife and erosion control. However, as succession progresses, most ruderal species tend to become much less prevalent and generally do not persist in the area. Most ruderal plant species are expected to decrease to non significant population levels within ten years after the initial disturbance. For information on TES, FC, or MIS plant species see Sections 3.8 and 3.9, and Appendix A.

There is a 6,000 acre Nolichucky Gorge proposed State Natural Heritage Area within the botanical AA. Initially it appeared the proposal would affect 21 acres (stand 69-3) of this proposed State Natural Heritage Area. However, a visit to this stand by Michael Schafle, State Heritage Ecologist and David Danley, USFS Botanist determined that stand 69-3 was incorrectly included in the Nolichucky Gorge proposed State Natural Heritage Area. Therefore, all action alternatives would not affect the Nolichucky Gorge proposed State Natural Heritage Area.

The persistence of most non-native plant species is not considered desirable to natural ecosystem health. There are primarily two ways in which non-native plant species may persist in the forested ecosystems. A non-native plant species may persist by the introduction of an “invasive

non-native species” to the ecosystem or by modification of the ecosystem in such a way that an invasive species becomes dominant. Out of the 124 species of non-native plants known to occur on the Pisgah Nantahala National Forest, 25 are currently recognized as having aggressive invasive qualities that can dominate local communities (Danley and Kauffman, Regional Foresters, May 2001, List of Invasive Exotic Plant Species). The proliferation of these species can have a detrimental and long lasting effect on natural communities and native species. Kudzu, *Pueraria montana*, is a familiar example of this sort of non native persistent species. Consideration was given to the possible effect this proposal may have to invasive non-native species.

Surveys for invasive species were conducted (2004) within the activity areas and around roads to the activity areas. Eleven species on the Regional Forester’s invasive non native plant species are known within the AA (see following table). It is recommended that the known populations of *Miscanthus sinensis*, *Paulownia* and *Rosa multiflora* be controlled to reduce possible adverse effect of invasive plant species to this proposal (see management recommendation given below). The invasive plants *Microstegium vinineum*, *Lonicera japonica* and *Allium vineale* (wild garlic) are so well established in parts of the AA that control by any currently known method is entirely impractical. It is not known what affect, if any, this proposal would have on the populations of *Lonicera japonica* and *Allium vineale* within the AA. There may be temporary increases in *Microstegium vinineum* – treatment would occur on roads adjacent to harvested stands.

The populations of *Lespedeza cuneata*, *Lolium arundinaceum* and *Coronilla varia* are not known to be invasive within natural forested communities within the mountains. While *Lespedeza cuneata*, *Lolium arundinaceum* and *Coronilla varia* may be invasive in Coastal Plain, Piedmont regions and rare natural areas (i.e. serpentine glades), they are not expected to be a concern in this proposal and/or the AA as they are not known to be invasive within natural forested communities within the mountains. Therefore, it is not recommended that these species be controlled. The following table displays non-native invasive plant species in the activity areas:

**Table 3-6: Non-native Invasive Plant Species Summary**

Species	Regional Category	Location In Activity Areas	Recommendation
<i>Ailanthus altissima</i>	1	Not recorded	Control all populations prior to disturbance on NFS land
<i>Rosa multiflora</i>	1	Along FSRs 5583, 5565 and 5570	Control all populations prior to disturbance on NFS land
<i>Celastrus orbiculata</i>	1	Not recorded	Control all populations prior to disturbance on NFS land
<i>Lespedeza cuneata</i>	1	Wildlife Fields, roadsides	This species does not display invasive tendencies. Not recommended to control.
<i>Paulownia tomentosa</i>	1	Along FSRs 5583, 5565 and 5570	Control all populations prior to disturbance on NFS land
<i>Lolium arundinaceum</i>	1	Wildlife Fields	This species does not display invasive tendencies. Not recommended to control.
<i>Lonicera japonica</i>	1	Alluvial Forest along Nolichucky	No effective control method known. No recommendation to control.
<i>Microstegium vinineum</i>	1	Mostly in Alluvial Forests and cove.	Treat along roads adjacent to harvested stands.

Species	Regional Category	Location In Activity Areas	Recommendation
		Very well established	
<i>Miscanthus sinensis</i>	2	Along FSRs 5583, 5565 and 5570	Control all population prior to disturbance on NFS land
<i>Allium vineale</i>	1	Wildlife Fields, road edges	Wildlife Fields
<i>Coronilla varia</i>	2	Found only along system roads	This species does not display invasive tendencies. Not recommended to control

The other way in which non-native plants may persist in the area is by continual disturbance. For example, a maintained road shoulder or wildlife field often has persistent ruderal and non-native plant species. These areas are often maintained in an early successional state for wildlife or human benefit. Therefore, it is expected that this proposal could slightly increase the persistence of non-native vegetation in the analysis area. To reduce this effect, it is recommended that native plants be utilized in wildlife improvement and roadside erosion control plantings. It is recognized that erosion control and wildlife production are the primary goals of seeding areas and some non-native plant species may be highly beneficial to accomplish these goals. However, a presidential executive order [Executive Order 11987, Title 3- The President] and Proposed Directive for Native Plant Materials (FSM 2070) recognizes the need to reduce the impact of non-native species by reducing the amount in which non-native plant species are planted on federal property. All the goals of erosion control, wildlife production, and encouragement of native plant species may be met by planting native plant species or a suitable mixture of native and non-native mixture of species.

## 3.4 Herbicides

### 3.4.1 Alternative A – Direct, Indirect, and Cumulative Effects

Under this alternative, there would be no adverse direct, indirect, or cumulative effects to wildlife, water quality, and humans as related to herbicide use as none would be applied. The existing condition would remain the same; invasive and invasive exotic plant species would likely continue to spread in the AA. There are no other known foreseeable actions in the activity areas that could affect herbicide use.

### 3.4.2 Alternatives B & C – Direct, Indirect, and Cumulative Effects

The following table displays expected maximum acreages of herbicide treatment (Glyphosate, Triclopyr, and Imazapic) that may occur:

**Table 3-7: Maximum Acres of Pesticides Applied Manually by Alternative<sup>1</sup>**

Herbicide	Alternative A	Alternative B	Alternative C
Triclopyr/Glyphosate/Imazapic (ac) <sup>2</sup>	0	203	120

1 – Not all acreage is treated, i.e. buffers along streams and “non-target” species would not be treated. Herbicides are applied manually and would not be applied aerially (see also Appendix F). Herbicides are primarily applied to stems during TSI and to foliage on non-native invasives.

2 – Acres include treatment for timber stand improvement, site preparation, non-native invasive species, daylighting, and wildlife fields

Use of herbicides is not expected to have measurable adverse effects on wildlife, water quality, and humans due to proper application as per Material Safety Data Sheets (MSDSs), product labels, risk assessments, fact sheets, mitigation measures contained in the *Vegetation Management in the Appalachian Mountains* (VMAM) FEIS, issued in July 1989, Forest Plan standards and guidelines (Forest Plan, page III-181), and design features disclosed in Appendix F. The use of herbicides poses some risk to wildlife, water quality, and humans; however, any pesticides applied would be done according to the labeling information, at the lowest rate effective at meeting project objectives in accordance with guidelines for protecting the environment, and manually (not aerially). This risk is further reduced by requiring the applicator to be trained in safety precautions, proper use, and handling of herbicides. Other factors reducing risk are the low level of active ingredient per acre and placement of notice signs in areas where herbicides have been applied. The signs include information on the herbicide used, when it was applied, and who to contact for additional information. It is expected that up to three applications of herbicide treatment could be required within about a five year period to adequately reduce non-native invasives in the activity areas.

Herbicide with the active ingredients Glyphosate and Triclopyr are not considered soil active. In addition, with the provision of riparian buffer strips on stream zones, the risk of herbicide spills or movement into stream zones is further reduced. Due to project design, effects of the treatment would be limited to individual trees/plants and the immediate area near them and is not expected to adversely affect private residences downstream. All applicable mitigation measures contained in the VMAM FEIS and Forest Plan standards and guidelines would be followed. A complete discussion of the effects of herbicides is contained in this FEIS, to which this analysis tiers to. Current pesticide information for Glyphosate and Triclopyr may be found at: <http://www.fs.fed.us/foresthealth/pesticide/risk.shtml>

Impacts of herbicide use to wildlife, water quality, and humans are expected to be low due to proper handling and application. The use of herbicides would have no measurable impact on water quality because according to the Vegetation Management FEIS “*No herbicide is aerially applied within 200 horizontal feet, nor ground-applied within 30 horizontal feet, of lakes, wetlands, or perennial or intermittent springs and streams. No herbicide is applied within 100 horizontal feet of any public or domestic water source. Selective treatments (which require added site-specific analysis and use of aquatic-labeled herbicides) may occur within these buffers only to prevent significant environmental damage such as noxious weed infestations. Buffers are clearly marked before treatment so applicators can easily see and avoid them*” (Veg. Mgt. FEIS, page II-67). There would be no adverse effects (direct, indirect, or cumulative) of the usage of herbicides associated with the action alternatives if no spills occur within riparian areas—no herbicide would be applied within at least 30 feet of riparian areas. According to the Veg. Mgt. FEIS, “*The greatest hazards to surface and ground water quality arise from a possible accident or mishandling of concentrates during transportation, storage, mixing, and loading, equipment cleaning, and container disposal phases of the herbicide use cycle*”. Herbicides would be mixed at the pesticide storage building at the Appalachian Ranger District Work Center and not in the field and applicators do not carry concentrated amounts of herbicide in the field. There are no other known foreseeable applications of herbicides on NFS lands in the Shinwhite area that could affect herbicide use with this proposal—the last measurable herbicide use on NFS lands in the Shinwhite area was about 10 years ago in Compartments 68 and 70. The Forest Service is unaware of any large-scale quantities of herbicide being applied on adjacent non-NFS lands within the watershed that could cause adverse cumulative effects. Individual

home owners are expected to use herbicides on their properties; however, determining measurable amounts, formulations, locations, frequency, and timing of their use would be speculative. Additional project design features are listed in Appendix F below.

Effects from past activities listed in Table 3-3 above in the AA that used herbicides are not expected to cause adverse cumulative effects from herbicide use with this proposal because effects from each project are not expected to be cumulatively added together due to the project design of each, adherence to standards in the Vegetation Management FEIS and Forest Plan and the relatively small amount of acres treated within the entire 9,700 acre AA over the past 20 years.

### 3.5 Soil Resources

The following is an analysis of the soils that would be impacted by logging or temporary road construction activities in the project area. The following table lists the soil map units found by stand number:

**Table 3-8: Primary Soil Map Units by Stand by Action Alternative**

Primary Soil Map Unit Name (Series)	Stands <sup>1</sup>	Avg. Slope Percent <sup>2</sup>	Alternative A (acres)	Alternative B (acres)	Alternative C (acres)
Buladean-Chestnut (F)	65-1, 65-3, 65-6	50-95	0	48	33
Harmiller-Shinbone (D&E)	69-5, 70-8, 70-9	15-50	0	50	22
Keener-Lostcove (D)	65-1, 65-3	15-30	0	16	8
Pigeonroost-Edneytown (D&E)	65-1, 65-3, 65-6	15-50	0	35	23
Soco-Stecoah (E)	68-5, 70-8 <sup>3</sup> , 70-9	30-50	0	38	16
Sylco-Soco (D)	68-5	15-30	0	8	8
<b>Total Acres</b>			<b>0</b>	<b>195</b>	<b>110</b>

1 – Portions of soil map units make up each stand

2 – Average slope percent ranges are for soil map units from NRCS data and are not necessarily the average slope within the stand (A = 0% - 2%, B = 2% - 8%, C = 8% - 15%, D = 15% - 30%, E = 30% - 50%, and F = 50% - 95%)

3 – Requires 500 feet of temporary road construction for access in Alternative B

The following table displays characteristics of each soil map unit:

**Table 3-9: Comparison of Soil Map Units**

Map Unit Name (Series)	Characteristics
Buladean-Chestnut	The Buladean series consists of deep, well drained soils with moderately rapidly permeability. They formed in residuum affected by soil creep in the upper part, that is weathered from felsic or mafic, high-grade metamorphic or igneous rock such as granite, hornblende gneiss, granodiorite, biotite gneiss, and high-grade metagraywacke. The Chestnut series consists of moderately deep, well drained soils on gently sloping to very steep ridges and side slopes of the Blue Ridge (MLRA 130). They formed in residuum that is affected by soil creep in the upper part, and weathered from felsic or mafic igneous or high-grade metamorphic rocks such as granite, hornblende gneiss, granodiorite, biotite gneiss, and high-grade metagraywacke.
Harmiller-Shinbone	The Harmiller series consists of moderately deep well drained soils with moderate permeability. They formed in residuum affected by soil creep in the upper part, weathered from low-grade metasedimentary rocks such as feldspathic metasandstone, metasilstone, and phyllite. These soils are on ridges and side slopes

Map Unit Name (Series)	Characteristics
	in the Blue Ridge (MLRA 130). The Shinbone series consists of deep, well drained soils with moderate permeability. They formed in residuum affected by soil creep in the upper part that weathered from low-grade metasedimentary rocks such as feldspathic metasandstone, metasilstone, and phyllite. These soils are on ridges and side slopes in the Blue Ridge (MLRA 130).
Keener-Lostcove	The Keener series consists of very deep, well drained soils that formed in loamy colluvium weathered from low-grade metasedimentary rocks low in weatherable minerals. They are on foot slopes, benches, colluvial fans and in coves of the Blue Ridge (MLRA 130). The Lostcove series consists of very deep, well drained soils on benches, foot slopes, toe slopes, colluvial fans, and in coves in the Blue Ridge (MLRA 130). They formed in colluvium from low-grade metasedimentary rocks low in weatherable minerals. Slope ranges from 2 to 95 percent.
Pigeonroost-Edneytown	The Pigeonroost series consists of moderately deep, well drained, moderately permeable soils on ridges and side slopes of the Blue Ridge (MLRA 130). They formed in residuum affected by soil creep in the upper part and weathered from felsic to mafic, igneous and high-grade metamorphic rocks. The Edneytown series consists of very deep, well drained, moderately permeable soils on ridges and side slopes of the Blue Ridge (MLRA 130). They formed in residuum that is affected by soil creep in the upper part, and weathered from felsic to mafic, igneous and high-grade metamorphic rocks.
Soco-Stecoah	The Soco series consists of moderately deep, well drained, moderately rapid permeable soils on ridges and side slopes of the Blue Ridge (MLRA 130). They formed in residuum that is affected by soil creep in the upper part, and is weathered from coarse grained low-grade metasedimentary rocks such as metasandstone and metagraywacke, occasionally interbedded with phyllite or slate. The Stecoah series consists of deep, well drained, moderately rapid permeable soils on ridges and side slopes of the Blue Ridge (MLRA 130). They formed in residuum that is affected by soil creep in the upper part, and weathered from coarse grained metasedimentary rocks such as metasandstone and metagraywacke, occasionally interbedded with phyllite or slate.
Sylco-Stecoah	The Sylco series consists of moderately deep, somewhat excessively drained soils on mountain ridge summits and side slopes in the Blue Ridge (MLRA 130). They formed in residuum that is affected by soil creep in the upper part, and weathered from metasedimentary rocks such as phyllite, slate, and metsandstone. The Stecoah series consists of deep, well drained, moderately rapid permeable soils on ridges and side slopes of the Blue Ridge (MLRA 130). They formed in residuum that is affected by soil creep in the upper part, and weathered from coarse grained metasedimentary rocks such as metasandstone and metagraywacke, occasionally interbedded with phyllite or slate.

### 3.5.1 Alternative A – Direct, Indirect, and Cumulative Effects

There would be no adverse effects to soils with this alternative because no activities are proposed. Any areas with current erosion would not be corrected. Soil displacement and compaction related to temporary road construction and landing construction would not occur.

### 3.5.2 Alternatives B and C Direct, Indirect, and Cumulative Effects

#### 3.5.2.1 Direct and Indirect Effects

There are no anticipated adverse effects to soils with either of these alternatives because the soil types in the project area are moderately to very deep and well to excessively drained (reducing potential for compaction); would not be taken out of production through permanent road construction; and would have project design features (Section 2.4, Chapter 2) and Forest Plan

standards (BMPs) applied to further reduce potential for compaction and long-term damage. Alternative B proposes 186 acres of harvest using ground-based systems and Alternative C proposes 103 acres; less than 2% of the AA. Neither alternative proposes new road construction.

### **3.5.2.2 Cumulative Effects**

Effects from ground-disturbing activities listed in Table 3-3 above are not expected to cause adverse cumulative effects to soil resources because effects from each project are not expected to be cumulatively added together due to the project design of them, the amount of time between this proposal and the last appreciable harvest-related activities (8-10 years ago), and adherence to Forest Plan standards (BMPs). The foreseeable repairs to FSRs 5570 and 278 related to the September 2004 storms would improve cumulative effects in the AA once implemented as sediment sources would be addressed—implementation of this action is subject to funding.

## **3.6 Cultural Resources**

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### **3.6.1 Alternative A – Direct, Indirect, and Cumulative Effects**

There are no expected adverse direct, indirect, or cumulative effects to cultural resources with this alternative because no ground disturbing activities are proposed.

### **3.6.2 Alternatives B & C – Direct, Indirect, and Cumulative Effects**

An archaeological review has been completed in the field and any sites eligible or potentially eligible for the National Register of Historic Places (NRHP) under Criteria D (36 CFR 60.4) have been identified. Class III sites are not eligible to the NRHP and may be affected by the proposed activities. There would be no adverse direct, indirect, or cumulative effects to Class I and unevaluated sites (Class II) with implementation of these alternatives as identified cultural sites would be protected by excluding them from the treatment areas. There are no expected adverse cumulative effects to cultural resources as a result of the proposal and the actions listed in Table 3-3 above.

## **3.7 Scenery Resources**

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### **3.7.1 Existing Condition**

Shinwhite project area is located on the Pisgah National Forest, Appalachian Ranger District; in the vicinity of Indian Grave Gap on the TN-NC state line. Management Areas in the project area include 1B, 2C, 3B, 5, 14 & 18. All proposed activities are in MA 3B. Management Area 3B has an assigned Visual Quality Objective (VQO) of Modification (M) in all Distance Zones and Sensitivity Levels; except where seen from the Appalachian Trail, where the VQO is Partial Retention (PR) in Foreground and Middleground Distance Zones. Partial Retention VQO must be met within two growing seasons, and M is allowed three. Refer to the Nantahala and Pisgah Land and Resource Management Plan (Forest Plan) for specific definitions of visual management terminology, and Management Area standards.

Scenery consists of the combination of landforms, rock outcrops, water bodies, and vegetation as seen across the landscape. From viewpoints analyzed for this project, modifications to the landscape can be seen on public lands in the form of clearings, roads, and timber harvests. National Forest lands seen in the middleground appear as a continuous hardwood-conifer forest

with patches of younger trees in areas of past timber management. The logging roads and landings used to harvest these areas are seen as well. Existing harvest areas vary in size and the degree to which they blend-in with the surrounding forest. Many views are screened by foreground vegetation during leaf-on season, and would be filtered during leaf-off season; others are open and unobstructed. Foreground views are of mixed hardwood-conifer forests with an open understory in places and dense Rhododendron in others. Middleground views are generally of forested lands.

Recreation use in the project area consists of hunting, fishing, hiking, backpacking, mountain biking, horseback riding, nature study, swimming, rafting and kayaking. There are no developed Forest Service recreation sites in the project area. The proposed Nolichucky Wild and Scenic River is in the project area, but no activities are proposed in the river corridor.

Management Area 14 is the Appalachian National Scenic Trail corridor. The Appalachian Trail (AT) forms the northern project boundary. The Forest Plan established specific management guidelines for the protection of scenery and recreation experience from the trail. All guidelines would be followed.

All potential impacts to recreation would be of a temporary nature. Hunting opportunities may be improved. Mountain bikers, hikers and horseback riders may encounter logging trucks or harvest activities when using Forest Service system trails or system roads, and views of additional timber harvest areas would be seen along these roads and trails. The same would be true of those using other FS system roads that are not designated as trails. Nolichucky River and Appalachian Trail users may hear the sounds of logging activities and see logging trucks on access roads, but this would be of a short duration. No recreation opportunities would be permanently altered or diminished by proposed management activities.

### **3.7.2 Scenery Analysis**

Viewpoint locations and potential visibility of treatment areas were analyzed with GIS software and a field survey. All travel corridors, water bodies and use areas in and around the project area were considered for potential viewpoints.

The following list identifies the location of VPs considered in the analysis. Many of the locations are specific points, while others are segments of trail or road. Some of the views would be seen as the viewer is moving (in a vehicle, walking, horseback, etc.), others are stationary. Views may be filtered or seasonally screened by foreground vegetation; others are open and unobstructed. The degree of potential impact varies with these and several other factors such as distance from viewer, viewer position, slope, size, shape and type of proposed harvest or road, landing, etc. All of these factors are considered when determining what activities would meet assigned VQOs or what mitigation would be required.

#### **3.7.2.1 Viewpoints**

- Appalachian Trail (west of Indian Grave Gap to east of Beauty Spot)
- State Roads: SR1455 & SR197
- Forest Service Roads: FSR5583, FSR278, FSR5565, FSR5570
- Forest Service Trail: TR187 (FSR5583)
- Nolichucky Wild and Scenic River

### 3.7.3 Effects by Alternative

#### 3.7.3.1 Alternative A (No Action) Direct & Indirect Effects

No action alternative -- all VQOs would be met.

#### 3.7.3.2 Alternative B (Proposed Action) Direct & Indirect Effects

This alternative proposes 186 acres of two-age regeneration harvest in six stands, daylighting 4 miles of system road, creation of two new wildlife fields, and a variety of other wildlife and non-commercial silviculture treatments. All commercially harvested areas would be tractor logged using existing roads and skid trails; except construction of a 500 foot temporary haul road between stands 70-8 and 70-9.

With implementation of scenery project design features, all actions in this alternative would meet assigned VQOs from all VPs analyzed.

**Table 3-10: Alternative B Scenery Analysis**

Treatment Area	Proposed Treatment	VQO	Project Design Features
65-1	Two-age Regeneration	M	1, 2
65-6	Two-age Regeneration	M	1, 2
68-5	Two-age Regeneration	PR, M	1, 2, 3
69-5	Two-age Regeneration	M	1, 2
70-8	Two-age Regeneration	M	1, 2
70-9	Two-age Regeneration	M	1, 2
Beauty Spot	Create 2 wildlife fields	R	4

1. Limit openings along trails, open roads, and closed roads used as trails to 500 linear feet; and screen or blend-in skid trails & log landings to extent possible.
2. Remove or lop and scatter slash to within 4 feet of ground for 50 feet beyond edge of trails, open roads, and closed roads used as trails.
3. Drop upper unit boundary one tree height below ridge.
4. Work with Appalachian Trail Conservancy, trail club and FS landscape architect to determine location and size of proposed wildlife openings at Beauty Spot.

#### 3.7.3.3 Alternative C Direct & Indirect Effects

This alternative proposes 101 acres of two-age regeneration harvest in four stands, daylighting 4 miles of system road, creation of 2 new wildlife fields, and a variety of other wildlife and non-commercial silviculture treatments. All commercially harvested areas would be tractor logged using existing roads and skid trails; no new road construction is proposed.

With implementation of scenery project design features, all actions in this alternative would meet assigned VQOs from all VPs analyzed.

**Table 3-11: Alternative C Scenery Analysis**

Treatment Area	Proposed Treatment	VQO	Project Design Features
65-1	Two-age Regeneration	M	1, 2
65-6	Two-age Regeneration	M	1, 2
69-5	Two-age Regeneration	M	1, 2
70-9	Two-age Regeneration	M	1, 2
Beauty Spot	Create 2 wildlife fields	R	4

1. Limit openings along trails, open roads, and closed roads used as trails to 500 linear feet; and screen or blend-in skid trails & log landings to extent possible.

2. Remove or lop and scatter slash to within 4 feet of ground for 50 feet beyond edge of trails, open roads, and closed roads used as trails.
3. Drop upper unit boundary one tree height below ridge.
4. Work with Appalachian Trail Conservancy, trail club and FS landscape architect to determine location and size of proposed wildlife openings at Beauty Spot.

### 3.7.3.4 Cumulative Effects

Past timber harvest areas, clearings, roads, structures, power lines and other landscape modifications are visible on National Forest System and private lands as seen from analyzed VPs. The degree to which these modifications impact scenic quality varies greatly with the type, scale, and contrast with the surrounding natural landscape. Treatments proposed in the action alternatives would create openings, or the canopy may appear thinner. In leaf-off season, segments of reconstructed road may be visible or existing roads may become more visible after harvest. However, scenery mitigation is designed with consideration for cumulative effects of proposed, existing and foreseeable future landscape modifications. If the proposed actions in each alternative are implemented with scenery project design features, the assigned VQOs would be met even where proposed activities would be seen in conjunction with other existing and future landscape modifications.

## 3.8 Management Indicator Species

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### 3.8.1 Introduction

An assessment of habitat changes linked to management indicator species (MIS) and habitat components is documented in this section based on the new species list that became effective Forest-wide on October 1, 2005. The assessment provides a checkpoint of project level activities, the anticipated change in habitat used by MIS, and the likely contribution to Forest-wide trends. Additional information on MIS, as well as other species, is located in the wildlife, aquatics, and botanical resource reports located in the project record.

### 3.8.2 Process

The Forest-wide list of MIS was considered as it relates to this project analysis area. Only those MIS that occur or have habitat within the project analysis area and may be affected by any of the alternatives were carried through a site-specific analysis. The documentation below shows which MIS were and were not analyzed along with the reasons.

Consistent with the Forest Plan and its associated FEIS (Volumes I and II), the effects analyses focus on changes to MIS habitat. These project-level effects are then put into context with the Forest-wide trends for populations and habitats.

To process and document the information efficiently, a series of tables are used as follows:

- 1) **Table 3-12:** This table displays biological communities and associated MIS, and reasons species were, or were not selected for analysis in the project. The source of these tables is Amendment 17 to the Nantahala and Pisgah Land and Resource Management Plan effective October 1, 2005, and the associated preliminary analysis (PA) and project record.
- 2) **Table 3-13:** This table displays the habitat components and associated MIS, and reasons species were, or were not selected for analysis in the project.

- 3) **Table 3-14:** This table displays by MIS the Forest-wide population trend along with the associated biological community or special habitat. The information in this table is taken from the MIS Report for the Nantahala and Pisgah National Forests.
- 4) **Table 3-15:** This table compares the effects (expressed as changes in habitat) by alternative to the Forest-wide estimates of habitats for each habitat component considered in the project-level analysis. This table explains how the project's effects to habitats affect Forest-wide population cumulative trends for the species considered.

**Table 3-12: Biological Communities, associated MIS, and why Species were Chosen or Eliminated from Analysis**

Biological Community	MIS	Analyzed Further/ Evaluation Criteria*
Fir dominated high elevation forests	Fraser fir	No/1
Northern hardwood forests	Ramps	No/1
Carolina hemlock bluff forests	Carolina hemlock	No/1
Rich Cove forests	Ginseng	No/1
Xeric yellow pine forests	Pine warbler	No/1
Reservoirs	Largemouth bass	No/1
Riparian forests	Acadian flycatcher	No/2
Coldwater streams	Wild trout (brook, brown, and rainbow); blacknose dace	Yes
Coolwater streams	Smallmouth bass	No/1
Warmwater streams	Smallmouth bass	No/1

- \*1 Biological Community and its represented species do not occur within the activity areas; therefore, this biological community would not be affected by any of the alternatives. Given no effects to the community, the alternatives in this project would not cause changes to forest-wide trends or changes in population trends of species associated with this community.
- 2 Biological Community and its represented species would be protected in accordance with LRMP standards and guidelines. Populations would not be affected by management activities because the associated habitat would not be entered by the proposed activities, pursuant to forest plan direction; therefore, there would be no change to forest-wide population trends.

**Table 3-13: Habitat Components Associated MIS and why Species were Chosen or Eliminated from Analysis**

Habitat Components	MIS	Analyzed Further/ Evaluation Criteria*
Old Forest Communities (100+ years old)	Black bear	No/1
Early successional (0-10 years old)	Rufous-sided (eastern) towhee	Yes
Early successional (11-20)	Ruffed grouse	No/1
Soft mast producing species	Ruffed grouse	Yes
Hard mast-producing species (>40 yrs)	Black bear	Yes
Large contiguous areas with low levels of human disturbance	Black bear	No/1
Large contiguous areas of mature deciduous forest	Ovenbird	No/2
Permanent grass/forb openings	White-tailed deer	Yes

Downed woody debris	Ruffed Grouse	Yes
Snags	Pileated woodpecker	No/2

- \*1 Habitat and its represented species do not occur within the project area; therefore, this special habitat would not be affected by any of the alternatives. Given no effects to the habitat, the alternatives in this project would not cause changes to forest-wide trends or changes in population trends of species associated with this habitat.
- 2 Habitat and its represented species would be protected in accordance with LRMP standards and guidelines. Populations would not be affected by management activities; therefore, there would be no change to forest-wide population trends.

**Table 3-14: MIS Estimated Population Trend and Biological Community or Habitat Component**

Species	Estimated Population Trend	Biological Community and/or Habitat Component
Black Bear	Increasing	Hard mast-producing species (>40 yrs)
White Tailed Deer	Static to decreasing	Permanent grass-forb openings
Rufous-Sided (Eastern) Towhee	Decreasing	Early-successional (0-10)
Ruffed Grouse	Static	Soft mast producing species & Downed woody debris
Wild Brook, Brown and Rainbow Trout; Blacknose Dace	Static	Coldwater streams

**Table 3-15: Habitat Component, Forest-wide Estimates, and Expected Changes resulting from the Alternatives**

Habitat Component	Forest-wide Estimate	Alternative A	Alternative B	Alternative C
Early successional (0-10 years old)	26,800 ac (yr 2000) 2,040 ac (5 yr avg)	Minor decrease after 2008	229 ac or 2% increase over next 10 years	144 ac or 2% increase over next 10 years
Soft mast producing species	13,144 ac early seral (yr 2000), highest potential on 5,650 ac	No change	229 ac increase for next 15-20 years	144 ac increase for next 15-20 years
Hard mast-producing species (>40 yrs)	High EI Red oak: 40,600 ac Mesic Oak/H: 283,340 ac Dry Mesic Oak/H: 21,800 ac Chestnut Oak/H: 8,600 ac Upland hwd (other): 6,900 ac	None affected	Up to 210 ac or 2.8% reduction	Up to 123 ac or 1.6% reduction
Permanent grass/forb openings	3,000 acres	No change	4 ac or 3.7% increase	4 ac or 3.7% increase
Coldwater streams	5,060 miles	No change	None affected because there are no stream crossings associated with either action alternative and no cutting within the 100 foot riparian area of any analysis area stream, therefore there would be no impacts to the 20.5 miles of coldwater habitat within the aquatic	None affected because there are no stream crossings associated with either action alternative and no cutting within the 100 foot riparian area of any analysis area stream, therefore there would be no impacts to the 20.5 miles of coldwater habitat within the aquatic

Habitat Component	Forest-wide Estimate	Alternative A	Alternative B	Alternative C
			analysis area.	analysis area.
Downed woody debris	High accumulation small wood: 18,000; Large wood: 386,000; Low accumulation (approximately 600,000)	No change	229 ac increase	144 ac increase

### 3.9 Threatened, Endangered, Sensitive, and Forest Concerns Species \_\_\_\_\_

#### Introduction

This section discloses the determination of effects the proposal may have on threatened and endangered (T&E); Regional Forester’s sensitive (S); and Forest Concern (FC) aquatic, wildlife, and botanical species—see Appendix A, BE for complete disclosure of surveys, habitat, species, and effects analyses. There would be no effect to any TES or FC species under Alternative A as no actions are proposed—current conditions would be maintained.

#### 3.9.1 Threatened, Endangered, and Sensitive Species

This proposal would have no effect upon any federally listed (T&E) species. No T&E species or their habitat is known to occur in or near enough to proposed activities to be affected by this proposal. There is no occupied or unoccupied habitat recognized as essential for listed or proposed species recovery, or to meet Forest Service objectives for S species. Formal consultation with the USDI Fish and Wildlife Service is not required.

#### 3.9.2 Forest Concern Species

The following table lists the FC species that could occur within the AAs along with potential effects by species from Alternatives B or C:

**Table 3-16: FC Species and Potential Effects from Alternatives B or C**

Species	Habitat	Occurrence	Potential Effect
<b>Aquatic FC Species</b>			
<i>Cryptobranchus alleganiensis</i> (hellbender)	Lotic- large and clear, fast flowing streams	May occur in the aquatic analysis area	It is not expected that any off-site movement of soil or any other type of potential negative impacts would enter into aquatic activity or analysis area waters as a result of this project. No direct, indirect or cumulative effects would occur to <i>Cryptobranchus alleganiensis</i> as a result of the implementation of this project
<i>Micrasema burksi</i> (a caddisfly)	Lotic- streams	May occur in both the activity and analysis areas	Since there are no new stream crossings being placed into the aquatic activity area waters for the Shinwhite Project, there would be no direct effects to these species.
<i>Micrasema sprulesi</i> (a caddisfly)	Lotic-streams	May occur in both the activity and analysis areas	Since there are no new stream crossings being placed into the aquatic activity area waters for the Shinwhite Project, there would be no direct effects to these species.

Species	Habitat	Occurrence	Potential Effect
<i>Rhyacophila amicus</i> (a caddisfly)	Lotic-streams	May occur in both the activity area and analysis areas	Since there are no new stream crossings being placed into the aquatic activity area waters for the Shinwhite Project, there would be no direct effects to these species.
<i>Ophiogomphus mainensis</i> (Maine snaketail)	Lotic- rapids of rivers and streams	May occur in the activity area and analysis area	Since there are no new stream crossings being placed into the aquatic activity area waters for the Shinwhite Project, there would be no direct effects to these species.
<i>Gomphus adelphus</i> (Moustached clubtail)	Lotic- small rivers with rapids	May occur in the activity area and analysis area	Since there are no new stream crossings being placed into the aquatic activity area waters for the Shinwhite Project, there would be no direct effects to these species. N
<i>Erimystax insignis</i> (blotched chub)	Lotic-French Broad drainage	May occur in the analysis area of the Nolichucky River	It is not expected that any off-site movement of soil or any other type of potential negative impacts would enter into aquatic activity or analysis area waters as a result of this project. No direct, indirect or cumulative effects would occur to <i>Erimystax insignis</i> as a result of the implementation of this project.
<i>Luxilus chrysocephalus</i> (striped shiner)	Lotic- Cane River System	Not Likely to occur	Since there are no new stream crossings being placed into the aquatic activity area waters for the Shinwhite Project, there would be no direct effects to these species.
<i>Noturus flavus</i> (stonecat)	Lotic- Nolichucky, French Broad and Tennessee River drainages	May Occur in the aquatic analysis area of the Nolichucky River	It is not expected that any off-site movement of soil or any other type of potential negative impacts would enter into aquatic activity or analysis area waters as a result of this project. No direct, indirect or cumulative effects would occur to <i>Noturus flavus</i> as a result of the implementation of this project.
<i>Baetopus trishae</i> (a mayfly)	Lotic- streams	May occur in the activity area and analysis area	Since there are no new stream crossings being placed into the aquatic activity area waters for the Shinwhite Project, there would be no direct effects to these species.
<i>Drunella longicornis</i> (a mayfly)	Lotic- streams & rivers	May occur in the activity area and analysis area	Since there are no new stream crossings being placed into the aquatic activity area waters for the Shinwhite Project, there would be no direct effects to these species.
<i>Habrophleidiodes sp.</i> (a mayfly)	Lotic-very small streams	Not Likely to occur	Since there are no new stream crossings being placed into the aquatic activity area waters for the Shinwhite Project, there would be no direct effects to these species.
<i>Lampsilis fasciola</i> (wavy-rayed lampmussel)	Lotic- Rivers (historically French Broad, Pigeon) currently Little Tennessee	May Occur in the Nolichucky River	It is not expected that any off-site movement of soil or any other type of potential negative impacts would enter into aquatic activity or analysis area waters as a result of this project. No direct, indirect or cumulative effects would occur to <i>Lampsilis fasciola</i> as a result of the implementation of this project.
<b>Wildlife FC Species</b>			
<i>Autochton cellus</i> , Golden banded skipper	Moist woods near streams. Caterpillar host = hog peanut; adult	Record within AA, riparian area west of unit 70-9	No hog peanut or ironweed observed; therefore, neither action alternative would have an effect on the skipper.

Species	Habitat	Occurrence	Potential Effect
	host = ironweed & briar blossoms		
<i>Celastrina nigra</i> , Dusky azure	Rich, moist deciduous. Caterpillar host = goat's beard	Record within AA, southern edge of unit 70-9	The daylighting of Chestnut Mountain wildlife field may eliminate goat's beard plants on the east side of the field. Therefore, Alternatives B or C may adversely affect individual Dusky azure caterpillar or overwintering chrysalis and its habitat on approximately two acres
Botanical FC Species			
<i>Adlumia fungosa</i>	Rich Cove Forest, Montane Acidic Cliff, Montane Calcareous Cliff	Populations known along Nolichucky River within botanical AA. Populations are far removed from activity areas	No effect
<i>Botrychium matricariifolium</i>	Rich Cove Forest, Meadow	Not known within activity or botanical analysis area. Potential Habitat may occur within botanical analysis area	No effect
<i>Botrychium oneidense</i>	Northern Hardwood Forest, Rich Cove Forest, Southern Appalachian Bog	Not known within activity or botanical analysis area. Potential Habitat may occur within botanical analysis area	No effect
<i>Carex prijecta</i>	Swamp Forest Bog Complex	One historical population known along the headwater of Shinbone Creek. Population is far removed from activity areas	No effect
<i>Dicentra eximia</i>	Montane Acidic Cliff, Montane Mafic Cliff	Populations known along Nolichucky River within botanical AA. Populations are far removed from activity	No effect

Species	Habitat	Occurrence	Potential Effect
		areas	
<i>Dichodontium pellucidum</i>	Montane Acidic Cliff, Montane Mafic Cliff, spray cliff	One historical population known along Nolichucky River within botanical AA. Populations are far removed from activity areas	No effect
<i>Hydrophyllum macrophyllum</i>	Rich Cove Forest, Mesic Oak-Hickory, mafic rock	Not known within activity or botanical analysis area. Potential Habitat may occur within botanical analysis area	No effect
<i>Meehania cordata</i>	Northern Hardwood Forest, Boulderfield Forest, Rich Cove Forest	Not known within activity or botanical analysis area. Potential Habitat may occur within botanical analysis area	No effect
<i>Mylia tayorii</i>	Spray Cliff	Not known within activity or botanical analysis area. Potential Habitat may occur within botanical analysis area	No effect
<i>Sphagnum angustifolium</i>	Bogs	One population recently found near stand 69/3. Population is excluded from activity	No effect

- “Known to occur” Those species of which there is documentation that the species exists within a specified area, or it was found in the area during surveys.
- “Likely to occur” Those species of which there is no documentation of the species occurring in a specified area but are expected to occur based on documentation of very similar habitat to known populations. For purposes of the AQUA, it should be assumed that the species does occur in a specified area until presence/absence of the species is verified.
- “May occur” The species probably occurs in a specified area in the broadest sense. Only very general habitat preferences and species distribution are used to determine if a species may occur. This does not imply their existence in an area, but that their general habitat description is found in the area, so therefore the species may occur.

- “Not likely to occur” Suitable habitat for a species may exist in a specified area, but there is other information known about the area and/or the species to determine that it is not likely to occur. These species are not included in the analysis.
- “Does not occur” Exhaustive surveys (existing and ours) have not found the species in the project and/or analysis areas. These species are not included in the analysis.

## 3.10 Public Safety & Access Management ---

### 3.10.1 Introduction

Members of the public expressed concern with safety and access management within the White Oaks portion of the AA. Concerns centered on harvest-related activities (timber yarding and hauling) along FSR 5570 and potential delays this may cause to residents in the area who may need emergency medical services (EMS) responses.

### 3.10.2 Alternative A – Direct, Indirect, and Cumulative Effects

Under this alternative there would be no adverse direct, indirect, or cumulative effects to safety and access management as the existing condition would be maintained. There would be no adverse impacts to safety or access management from harvest-related activities.

### 3.10.3 Alternative B – Direct, Indirect, and Cumulative Effects

Under these alternatives there could be reasonable delays on FSR 5570 due to harvest-related activities as stands 65-1, 65-3, and 65-6 are logged; however timber sale clause B6.33 states: *Along roads available for public use the Purchaser shall immediately remove slash from traveled surfaces, shoulders, and drainage facilities* (see also Appendix F). Access on FSR 5570 would not be denied as a result of this alternative. Logging related activities are typically shut down from December 15 to March 15 due to freeze-thaw conditions and resource protection. Logging activities are expected to last about one harvest season in this area (east of Harmiller Gap). There are no other past, ongoing, or foreseeable actions listed in Table 3-3 above that would cause adverse cumulative effects to public safety or access management in the White Oaks area.

### 3.10.4 Alternative C – Direct, Indirect, and Cumulative Effects

Under this alternative, stand 65-3 would not be harvested. Effects are expected to be similar as Alternative B, but any potential delays would be even less than for Alternative B as one less stand in the area would be harvested with timber hauled on FSR 5570. As for Alternative B, access on FSR 5570 would not be denied as a result of this alternative. There are no other past, ongoing, or foreseeable actions listed in Table 3-3 above that would cause adverse cumulative effects to public safety or access management in the White Oaks area.

## 3.11 Other Areas of Concern ---

### 3.11.1 Alternative A – Direct, Indirect, and Cumulative Effects

Since no action is proposed under this alternative, there would be no direct, indirect, or cumulative effects to park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.

### **3.11.2 Alternative B – Direct, Indirect, and Cumulative Effects**

There would be no measurable direct, indirect, or cumulative effects from any of these alternatives because none of them propose actions within park lands, prime farmlands, wetlands (as per 1977 Executive Orders 11988 and 11990), wild and scenic rivers, or ecologically critical areas. It also would not violate local law or requirements imposed for the protection of the environment. There are no other known foreseeable actions in the activity areas that could adversely affect park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.

## CHAPTER 4 – PREPARERS AND PUBLIC INVOLVEMENT

The following individuals helped develop this environmental assessment:

### 4.1 ID Team Members ---

#### 4.1.1 Core IDT

Sandy Burnet - Zone Wildlife Biologist; Pisgah NF  
Eric Crews - Landscape Architect; NFs NC  
David Danley - Zone Botanist; Pisgah NF  
Michael Hutchins - Zone NEPA Coordinator; Pisgah NF  
Bob Noel - Zone Archaeologist; Pisgah NF  
Linda Randolph - Assistant District Ranger; Appalachian RD  
Lorie Stroup - Zone Fisheries Biologist; Pisgah NF

#### 4.1.2 Other Forest Service Personnel Providing Input

Paul Bradley – Appalachian District Ranger  
Matthew Eldridge – Wildlife Technician; Appalachian RD  
Paul Gilliland – Forester Trainee; Appalachian RD

### 4.2 Federal, State, and Local Agencies Providing Input ---

Brian Cole – USDI Fish and Wildlife Service  
Dave McHenry – North Carolina Wildlife Resources Commission  
Michael Schafale – NC Department of Environment and Natural Resources  
Dean Simon – North Carolina Wildlife Resource Commission

### 4.3 Others Providing Input ---

Kenneth Bryant  
Bruce Cunningham – Tennessee Eastman Hiking Club  
Dr. David Cort  
Jack Dalton – Carolina Mountain Club  
Matt Davis – Appalachian Trail Conservancy  
Powell Foster  
Bob Gale – Western North Carolina Alliance  
Hugh Irwin – Southern Appalachian Forest Coalition  
Ed Oliver – Tennessee Eastman Hiking Club  
Ben Prater – Southern Appalachian Biodiversity Project  
Earl J. Rayburn  
Dr. Charles & Charlene Thomas  
Charles Thomas III  
Charles Wilson

## **APPENDIX A – BIOLOGICAL EVALUATION**

BIOLOGICAL  
EVALUATION  
OF THE  
SHINWHITE PROJECT ENVIRONMENTAL ASSESSMENT

PISGAH NATIONAL FOREST  
APPALACHIAN RANGER DISTRICT  
MITCHELL & YANCEY COUNTIES  
NORTH CAROLINA

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## **I. INTRODUCTION**

The purpose of this biological evaluation (BE) is to provide the decision maker with relevant biological information as to the possible effects this proposal may have to Federally Threatened, Endangered (T&E) and Regional Forester's Sensitive (S) species.

This BE documents the possible biological effects of a proposed timber sale and improvements known as the Shinwhite Project Environmental Assessment (EA, 2005). Included within this preferred alternative proposal (Alternative C) are: using and maintain existing roads and skid trails, construction of temporary road, maintaining and construction of new wildlife fields, wildlife plantings, daylighting roads, treatment of exotic invasive species, site preparation and release of harvested areas, regeneration harvest treatment, soil and erosion treatment, and small patch old growth designation (see the EA for a complete description of acreage, distances, procedures, and areas).

A detailed description of the proposal is disclosed in Section 2.2, Chapter 2 of the Shinwhite Project EA. A list of project design features and monitoring is disclosed in Section 2.4 of the same Chapter. A list of definitions, including analysis areas is located at the end of this BE.

### **Location**

The proposal is located in the northern portions of Yancey and Mitchell Counties.

## **II. METHOD OF EVALUATION AND SURVEYS**

Potentially affected T&E and S (August 7, 2001) species and habitat were identified from the following sources:

- 1) Information on TES species and their habitat on the Nantahala and Pisgah National Forests were obtained from the North Carolina Wildlife Resources Commission (NCWRC), U.S. Fish and Wildlife Service (USFWS), and North Carolina Natural Heritage Program (NCNHP) occurrence records.
- 2) Surveys completed for this analysis, past surveys, and analysis for projects within or near the analysis areas.
- 3) Consulting with individuals both in the public and private sector who are knowledgeable of the area and its biota.

## **III. SURVEY INFORMATION**

### **A. BOTANICAL SURVEYS**

The proposed units were surveyed by David M. Danley, Forest Botanist on March 3, 29 April 5, 6, and May 1, 2, 9, 2006. All proposed units or activity areas were visited at least once during this time.

A field botanical field survey was completed of unit 69/5 with Michael Schafle, North Carolina Natural Heritage Program on March 3, 2006.

Other botanical survey information include: Biological surveys of the Nolichucky Gorge (2002) Carolyn Wells et.al. USFWS; Botanical surveys of the Nolichucky Gorge (2000) Brown, Schafle et.al: Sunshine Timber Sale, botanical report (1996, unpublished)

## **B. WILDLIFE SURVEYS**

Surveys of the proposed action areas were completed on April 26, May 2, 4, 24 and 26, 2006. Snail and salamander surveys found only common species occurred within the proposed units, except compartment 68, stand 5. Bird surveys were completed on May 26, 2006, and resulted in no TE S listed bird species occurring within these activity areas.

## **C. AQUATIC SURVEYS**

Project information was obtained from Linda Randolph, US Forest Service (USFS) Operations Assistant and Matt Eldridge, USFS Forestry Technician. Lorie Stroup, USFS Fisheries Biologists and Kerri Lyda, USFS Biological Technician conducted aquatic habitat and aquatic insect surveys of the proposed aquatic project and analysis areas in the spring of 2006. The surveys consisted of examining streams within the aquatic activity area, noting habitat quality, quantity, and suitability for rare aquatic and management indicator species (MIS), as well as existing impacts and their source. The Nolichucky River was surveyed last year for aquatic non-game species including mussels and has been surveyed seven times at the same location for an aquatic macroinvertebrate site by the Division of Water Quality (DWQ). Shinbone and White Oak Creeks have been surveyed by the USFS and the NCWRC as a part of the genetic brook trout surveys and historically for a previous timber sale in the early 1990's.

Existing data for aquatic resources within the aquatic AA is used to the extent it is relevant to the project proposal. This data exists in two forms: 1) general inventory and monitoring of Forest aquatic resources, and 2) data provided by cooperating resource agencies from aquatic resources on or flowing through the Forest. Both of these sources are accurate back to approximately 1980 and are used regularly in project analyses. Data collected prior to 1980 is used sparingly (mostly as a historical reference). Project-specific surveys are conducted to obtain reliable data where none exists.

Additional information specifically addressing aquatic species was obtained from NCWRC biologists, NCNHP records, North Carolina Department of Environment and Natural Resources (NCDENR) Division of Water Quality aquatic biologists, and USFWS biologists.

## **IV. EXISTING BIOLOGICAL CONDITION**

A detailed review of species information and habitat is within the botanical, aquatic, and, wildlife analyses located in the project record and has been prepared based on the best available information at the present time.

## A. TERRESTRIAL

The Shinwhite botanical analysis area can be characterized by low-mid elevation Appalachian Mountain region plant communities.

The area is dominated by the Nolichucky River and associated 2000 ft. Gorge. Plant communities directly adjacent to the river include: Alluvial Forest, Rich Cove Forest, Rocky Bar and Shore, and Spray Cliff. These deep gorge communities contain most of the element occurrences of TES plant species and Gorge (see following table). The steep mid and upper Nolichucky Gorge is dominated by dry Pine-Oak Heath communities with some natural White Pine communities in protected draws. These areas are unaffected by the proposal. Several dendrite trending drainages that intersect the Nolichucky/ Toe rivers run through the analysis area. These include Pigeon Roost Creek, Cooper Branch, Shinbone Creek, Bowling green Creek, White Oak Creek, etc. These drainages are often dominated by Acidic Cove Forest in the lower portion and Chestnut Oak Forest in the upper areas. A succession southwest to northeast trending, interlinking ridges is found between drains. The highest points of these ridges are about 4,200 ft. (Flat Top Mountain and Unaka Mountain, etc.).

Three common community types are characteristic within the analysis area. These communities are: Pine-oak Heath Forest, Chestnut Oak Forest, and Acidic Cove Forest, and, to a much lesser extent, the Montane Oak-Hickory Forest and Rich Cove Forest. A Montane Alluvial Forest and Rocky Shore and Bar communities are associated with the low elevation areas directly adjacent to major rivers are best developed along Nolichucky and Toe Rivers. Small habitat areas such as small rock outcrops and forested seeps and streams can be imbedded within these communities. Natural communities often grade together and definite boundaries usually difficult to see. However, there is often a pattern to these communities on the landscape. Within the AA, the Acidic Cove Forest often occupies areas near streams, lower cove slopes and northern aspects. Higher cove slopes, south and western slopes are often dominated by the Chestnut Oak Forest. Pine Oak Heath Community is found on dryer Ridges and slopes particularly in the Nolichucky Gorge. The deep gorge communities (Alluvial Forest, Rich Cove Forest, Rocky Bar and Shore, and Spray Cliff communities) have the most diverse herbaceous component of the communities found within the analysis area. However, taken in whole, the analysis area has a very poor herbaceous diversity. All of the communities that are within proposed activity areas are very common community types and have a relatively low probability of occurrences for Forest T&E, S, and FC plant species (see Schafale and Weakley for a detailed description and discussion of these communities); thus, making a general low potential for plant T&E, S, and FC species to occur in the potential activity areas. The primary natural communities affected by this proposal are the Chestnut Oak Forest and Acidic Cove Forest.

Using 1) the natural vegetation predictive model (S. Simon, USFS); 2) CISC data (USFS); and 3) field experience, the acres of natural communities are estimated in the following table within the botanical AA.

**Table A-1: Estimated Quantity of Communities within Botanical AA**

Community	EST. Acres/ % of Total Habitat in AA	Acres over 40 years old
Acidic Cove Forest	3,825 acres / 38%	3,515 acres
Chestnut Oak Forest/Pine Oak Heath	4,992 acres/ 50%	4,654 acres
Rich Cove Forest	39 acres/ >1%	39 acres
Alluvial Forest & gorge communities.	146 acres/ 1%	?
Montane Oak-Hickory Forest	377 acres/ 4%	352 acres
White Pine Forest	640 acres/ 6%	640 acres
<b>Totals</b>	<b>10,019 acres</b>	<b>9,200 acres</b>

**Terrestrial TES Species**

Of the 58 terrestrial TES species known to occur in Mitchell and Yancey Counties (Attachment 1), North Carolina; 18 are known to occur or may have habitat within the biological analysis. Of these 18 species, no TES species are known to occur in the activity area (see Table A-2 and Attachment 1 below). The possible effects to all TES species are discussed in the effects section. All other TES species were dropped from further consideration and discussion for one of the following reasons: 1) lack of suitable habitat for the species in the activity area, and/or 2) based on field surveys, of activity areas, no habitat or individuals were seen or detected 3) known populations are far enough away as to not be indirectly or directly effected by the proposed actions. No further analysis or discussion of effects is given for these TES species because there would be no effect to these species.

**B. AQUATIC**

**Aquatic Habitat**

Substrate within the activity area waters (Table 4.2) was evaluated and visually estimated. The three primary types of substrate that exist were documented at each macroinvertebrate sample site. This information is valuable for determining the amount of habitat available for proposed endangered, threatened, and sensitive species, MIS, as well as other aquatic organisms. Also indicated below is the NC Department of Environmental Management (DEM) designation and water quality standards known as “Classifications and Water Quality Standards Applicable to the Surface Waters and Wetlands of North Carolina.” These classifications are also used to assist in denoting what type of habitat is available to TES species.

**Table A-2: Forest Plan Watershed 22 (Nolichucky River)**

Stream Name (UT denotes an unnamed tributary)	Compartment- Stand	Miles in Activity area	Miles in Analysis Area
Hollow Popular Creek			0.8
Nolichucky River			5.7
UT1	69-5	0.1	0.6
UT2	69-5	0.3	0.4

Stream Name (UT denotes an unnamed tributary)	Compartment- Stand	Miles in Activity area	Miles in Analysis Area
UT3			1.3
UT3UT1			0.2
UT3UT2	65-6	0.1	0.6
UT4	65-3	0.5	1
UT4UT1	65-3	0.3	0.5
Shinbone Creek	70-9	0.2	2.7
	70-8	0.2	
UT1			0.9
UT2			0.4
UT3			0.1
UT4			0.9
UT1UT4	68-5	0.03	0.2
UT5	70-9	0.2	0.3
UT6			1.1
White Oak Creek			2.1
UT1	65-7	0.3	0.5
UT1UT1	65-7	0.2	0.2

Fish habitat exists within the analysis areas of Shinbone Creek, White Oak Creek Hollow Popular Creek and the Nolichucky River. Within the aquatic activity area, White Oak Creek has habitat for fish species, however, a ford located on FSR 5570 is considered a barrier for non-game fish species and during low flows could be a barrier for trout species. In the remaining areas, there is limited habitat for fish species within the activity area waters, due to small stream size and restricted flow regimes. Activity area waters provide habitat for macroinvertebrates.

#### Shinbone Creek

Shinbone Creek runs between compartments 68 and 70 and is adjacent to Stands 70/8 and 70/9. The substrate composition percentages for Shinbone Creek are 25% sand, 28% gravel, 20% cobble, 9% boulders and 18% organic material. Only the lower reaches of Shinbone Creek support habitat for fish populations of rainbow trout and beneficial sites are found for non-game fish spawning from the Nolichucky River. In the upper reaches fish habitat was not found.

There are a total of 5 unnamed tributaries (UT) to Shinbone Creek that were used for monitoring purposes and are adjacent to compartments in the timber sale. UT 1, 2 and 3 to Shinbone Creek are adjacent to stand 70/9. UT 4 to Shinbone Creek is adjacent to stand 68/5. UT 5 to Shinbone Creek is adjacent to stand 70/8. Average substrate composition percentages for the UT's to Shinbone Creek are 20% sand, 37% gravel, 23% cobble, 5% boulder and 15% organic material. There is no documented fish habitat found in the UT's to Shinbone Creek within the activity area of the Shinwhite Timber Sale.

## White Oak Creek

White Oak Creek is adjacent to stand 65-1. The substrate composition percentages are 40% sand, 25% gravel, 25% cobble and 10% organic material. There is fish habitat for brown trout and a possibility of non-game fish spawning from the Nolichucky River in the lower reaches.

The UT to White Oak Creek runs through stand 65-1. The substrate composition percentages are 22% sand, 17% gravel, 35% cobble, 13% boulders and 13% organic material. No fish habitat has been documented for UT to White Oak Creek during activity area surveys.

## Nolichucky River

The Nolichucky River is described as being wide and very sandy. Data shows the Nolichucky River as having one threatened species the *Alasmidonta raveneliana* (Appalachian elktoe) and four sensitive species: *Stygobromus carolinensis* (Yancey sideswimmer), *Etheostoma acuticeps* (sharphead darter), *Percina burtoni* (blotchside darter) and *Percina squamata* (olive darter). In the Shinwhite proposal stands 65-3 and 65-6 are located approximately 0.5 miles from the Nolichucky River.

The UTs to the Nolichucky River are adjacent to stands 65-3 and 65-6. The substrate composition percentages are 20% sand, 50% gravel, and 30% cobble. There is no documented fish habitat found.

Culverts along the FSRs 5570, 5583, and 5565 roads themselves, the existing ford in White Oak Creek on FSR 5570 and existing old roads and skid trails in the activity area are the existing threats to streams and drainages. Impacts from these sources are limited to down slope movement of sediment from road runoff and culvert fills. The road washing that occurred during the tropical storms in the fall of 2004 has caused and continues to cause off-site movement of soil into the aquatic analysis area waters. In most other cases, it is suspected that a majority of sediments from these sources are deposited in the natural vegetative filters before they reach areas of perennial streams.

## Aquatic TES Species

Of the five aquatic TES species known to occur in Mitchell and Yancey Counties (Attachment 1), North Carolina; three are known to occur or may have habitat within the biological AA. Of these species, no TES species are known to occur or have habitat in the activity areas (see Table A-2 and Attachment 1 below). The possible effects to all TES species are discussed in the effects section. All other TES species were dropped from further consideration and discussion for one of the following reasons: 1) lack of suitable habitat for the species in the activity area, and/or 2) based on field surveys, of activity areas, no habitat or individuals were seen or detected 3) known populations are far enough away as to not be indirectly or directly effected by the proposed actions. No further analysis or discussion of effects is given for these TES species because there would be no effect to these species.

### C. SUMMARY OF KNOWN AND LIKELY TES

The following table displays the occurrence of TES in the biological AAs:

A = Known to occur in activity area, effects analyzed below

B = Known in biological AA. not known in activity areas—not further analyzed.

C = Not known in biological AA or activity area , habitat may exist in biological AA—not further analyzed.

**Table A-3: TES Species known or Likely to Occur in Shadline Activity Areas or Biological AA(s)**

Species	Type	Habitat	Occurrence
<b>Federally Threatened or Endangered (T&amp;E) Species</b>			
<i>Alasmidonta raveneliana</i> (Appalachian elktoe)	Mussel	Lotic-fast, clean substrate rivers	<b>“C”</b> May occur in the aquatic analysis area of the Nolichucky River.
<i>Spiraea virginiana</i>	Vascular Plant	Sandy areas adjacent to large rivers.	<b>“B”</b> Three populations known along Nolichucky River within botanical AA. Populations are far removed from activity areas.
<b>2002 Region 8 Regional Forester’s Sensitive (S) Species List<sup>1</sup></b>			
<i>Aconitum reclinatum</i>	Vascular Plant	Northern Hardwood Cove Forest, Boulderfield Forest, High Elevation Seep, Rich Cove Forest	<b>“C”</b> Not known within activity or botanical analysis area. Potential Habitat may occur within botanical analysis area.
<i>Buckleya distichophylla</i>	Vascular Plant	Hemlock Hardwood Forest, Acidic Cove Forest, Montane Acidic Cliff, Mesic Oak-Hickory	<b>“B”</b> Several populations known within Nolichucky River gorge within botanical AA. Populations are far removed from activity areas.
<i>Coreopsis latifolia</i>	Vascular Plant	Rich Cove Forest, Northern Hardwood Cove Forest	<b>“C”</b> Not known within activity or botanical analysis area. Potential Habitat may occur within botanical analysis area.
<i>Delphinium exaltatum</i>	Vascular Plant	Rich Cove Forest, Grassy Bald, Glade,	<b>“C”</b> Not known within activity or botanical analysis area. Potential Habitat may occur within botanical analysis area.
<i>Diervilla rivularis</i>	Vascular Plant	Streamside, Acidic Cove Forest	<b>“C”</b> Not known within activity or botanical analysis area. Potential Habitat may occur within botanical analysis area.
<i>Diplophyllum apiculatum</i> var.	Moss	Roadbank	<b>“C”</b> Not known within activity or

Species	Type	Habitat	Occurrence
<i>taxifolioides</i>			botanical analysis area. Potential Habitat may occur within botanical analysis area.
<i>Etheostoma acuticeps</i> (Sharphead darter)	Fish	Lotic-streams in the Nolichucky River system (Toe and Cane Rivers)	<b>“B”</b> Likely to occur in the Nolichucky River within the aquatic analysis area.
<i>Euphorbia purpurea</i>	Vascular Plant	Northern Hardwood Forest, Rich Cove Forest, Mesic oak-hickory	<b>“C”</b> Not known within activity or botanical analysis area. Potential Habitat may occur within botanical analysis area.
<i>Helianthus glaucophyllus</i>	Vascular Plant	Rich Cove Forest, Northern Hardwood Forest, High Elevation Red Oak Forest, Mesic Oak-Hickory Forest, Roadside	<b>“C”</b> Not known within activity or botanical analysis area. Potential Habitat may occur within botanical analysis area.
<i>Juglans cinerea</i>	Vascular Plant	Rich Cove Forest, Mesic Oak-Hickory, Montane Alluvial Forest	<b>“C”</b> Not known within activity or botanical analysis area. Potential Habitat may occur within botanical analysis area.
<i>Marsipella emarginata</i> <i>var. latiloba</i>	Liverwort	Spray Cliff	<b>“C”</b> Not known within activity or botanical analysis area. Potential Habitat may occur within botanical analysis area.
<i>Penstemon smallii</i>	Vascular Plant	Montane Acidic Cliff	<b>“C”</b> Not known within activity or botanical analysis area. Potential Habitat may occur within botanical analysis area.
<i>Percina squamata</i> (Olive darter)	Fish	Lotic-streams within the Tennessee Drainage	<b>“B”</b> Likely to occur in the Nolichucky River within the aquatic analysis area.
<i>Plethodon welleri</i>	Salamander	Forest litter within deciduous forests with some Rhododendron	<b>“B”</b> known within wildlife AA. not known within activity areass
<i>Saxifraga caroliniana</i>	Vascular Plant	Northern Hardwood Forest, Montane Acidic Cliff, High Elevation Rocky Summit	<b>“C”</b> Not known within activity or botanical analysis area. Potential Habitat may occur within botanical analysis area.
<i>Scutellaria saxatilis</i>	Vascular Plant	Northern Hardwood Forest, Boulderfield Forest, Rich Cove Forest	<b>“C”</b> Not known within activity or botanical analysis area. Potential Habitat may occur within botanical analysis area.
<i>Silene ovata</i>	Vascular	Rich Cove Forest, Mesic Oak-	<b>“C”</b>

Species	Type	Habitat	Occurrence
	Plant	Hickory, Roadside, mafic rock	Not known within activity or botanical analysis area. Potential Habitat may occur within botanical analysis area.
<i>Thermopsis fraxinifolia</i>	Vascular Plant	Xeric Oak-Hickory Forest, Montane Oak Woodland, Pine-Oak/Heath	“C” Not known within activity or botanical analysis area. Potential Habitat may occur within botanical analysis area.
<i>Trillium rugelii</i>	Vascular Plant	Rich Cove Forest, low elevation	“C” Not known within activity or botanical analysis area. Potential Habitat may occur within botanical analysis area.
<i>Tsuga caroliniana</i>	Vascular Plant	Carolina Hemlock Forest, Montane Acidic Cliff, Pine-Oak/Heath, High Elevation Rocky Summit	“B” Populations known within Nolichucky River gorge and ridges within botanical AA. Populations are far removed from activity areas.

1 – August 7, 2001, Region 8 Regional Forester’s Sensitive species list

## V. EFFECTS/IMPACTS OF PROPOSED MANAGEMENT ON TES SPECIES

This section and Table A-4 summarize the effects to TES species. Other ecological effects or possible effects to other species may be found within the attached resource reports.

**Table A-4: Summary of effect/impact to TES Species known or Likely to Occur in Biological AAs**

(1) impacts to potential habitat analyzed below, (2) species not further analyzed

Species	Type	Effects/ Impact
<b>Federally Threatened or Endangered (T&amp;E) Species</b>		
<i>Alasmidonta raveneliana</i> (Appalachian elktoe)	Mussel	May occur in the aquatic analysis area of the Nolichucky River. No direct or indirect effect on population or potential habitat. (1)
<i>Spiraea virginiana</i>	Vascular Plant	Three populations known along Nolichucky River within botanical AA. Populations are far removed from activity areas. No direct or indirect effect on population or potential habitat. (2)
<b>2002 Region 8 Regional Forester’s Sensitive (S) Species List<sup>1</sup></b>		
<i>Aconitum reclinatum</i>	Vascular Plant	Not known within activity or botanical analysis area. Potential Habitat may occur within botanical analysis area. No direct or indirect impact to species. (1)
<i>Buckleya distichophylla</i>	Vascular Plant	Several populations known within Nolichucky River gorge within botanical AA. Populations are far removed from activity areas. No direct or indirect impact to species (1)
<i>Coreopsis latifolia</i>	Vascular Plant	Not known within activity or botanical analysis area. Potential Habitat may occur within botanical analysis area. No direct or indirect impact

Species	Type	Effects/ Impact
		to species. (1)
<i>Delphinium exaltatum</i>	Vascular Plant	Not known within activity or botanical analysis area. Potential Habitat may occur within botanical analysis area. No direct or indirect impact to species. (1)
<i>Diervilla rivularis</i>	Vascular Plant	Not known within activity or botanical analysis area. Potential Habitat may occur within botanical analysis area. No direct or indirect impact to species. (1)
<i>Diplophyllum apiculatum</i> var. <i>taxifolioides</i>	Moss	Not known within activity or botanical analysis area. Potential Habitat may occur within botanical analysis area. No direct or indirect impact to species. (1)
<i>Etheostoma acuticeps</i> (Sharphead darter)	Fish	Likely to occur in the Nolichucky River within the aquatic analysis area. No direct or indirect impact to species (1)
<i>Euphorbia purpurea</i>	Vascular Plant	Not known within activity or botanical analysis area. Potential Habitat may occur within botanical analysis area. No direct or indirect impact to species. (1)
<i>Helianthus glaucophyllus</i>	Vascular Plant	Not known within activity or botanical analysis area. Potential Habitat may occur within botanical analysis area. No direct or indirect impact to species. (1)
<i>Juglans cinerea</i>	Vascular Plant	Not known within activity or botanical analysis area. Potential Habitat may occur within botanical analysis area. No direct or indirect impact to species. (1)
<i>Marsipella emarginata</i> var. <i>latiloba</i>	Liverwort	Not known within activity or botanical analysis area. Potential Habitat may occur within botanical analysis area. No direct or indirect impact to species. (1)
<i>Penstemon smallii</i>	Vascular Plant	Not known within activity or botanical analysis area. Potential Habitat may occur within botanical analysis area. No direct or indirect impact to species. (1)
<i>Percina squamata</i> (Olive darter)	Fish	Likely to occur in the Nolichucky River within the aquatic analysis area. No direct or indirect impact to species (1)
<i>Plethodon welleri</i>	Salamander	Species occurs within Wildlife AA. No direct or indirect impact to species (1)
<i>Saxifraga caroliniana</i>	Vascular Plant	Not known within activity or botanical analysis area. Potential Habitat may occur within botanical analysis area. No direct or indirect impact to species. (1)
<i>Scutellaria saxatilis</i>	Vascular Plant	Not known within activity or botanical analysis area. Potential Habitat may occur within botanical analysis area. No direct or indirect impact to species. (1)
<i>Silene ovata</i>	Vascular Plant	Not known within activity or botanical analysis area. Potential Habitat may occur within botanical analysis area. No direct or indirect impact to species. (1)
<i>Thermopsis fraxinifolia</i>	Vascular Plant	Not known within activity or botanical analysis area. Potential Habitat may occur within botanical analysis area. No direct or indirect impact to species. (1)
<i>Trillium rugelii</i>	Vascular Plant	Not known within activity or botanical analysis area. Potential Habitat may occur within botanical analysis area. No direct or indirect impact to species. (1)
<i>Tsuga caroliniana</i>	Vascular Plant	Populations known within Nolichucky River gorge and ridges within botanical AA. Populations are far removed from activity areas. No

Species	Type	Effects/ Impact
		direct or indirect impact to species (1)

1 – August 7, 2001, Region 8 Regional Forester’s Sensitive species list

## A. EFFECTS/IMPACTS TO TES PLANT SPECIES

There are no impacts to TES plant species because there are no known species, or their habitats, within, or close to, the activity areas (botanical report, project record and Table A-4 above). There would be no direct, indirect, or cumulative impacts to these species and habitats because the proposed activities are far enough removed from them to be effected by the proposed actions.

### Impacts to Potential TES Plant Habitat

This discussion summarizes the possible effect on potential, or “apparently suitable habitat” for all potentially occurring TES plant species within the botanical AA, however none are known to occur within the activity area. All the potential activity areas were all surveyed for TES plant species and none were found. Therefore, this “potential” habitat is unoccupied and alteration of this would not impact populations of TES plant species. The below analysis is based upon current knowledge of species habitat parameters. Usually, these parameters are very broad habitat concepts. This discussion does not imply species occupancy in those areas. It examines potential suitable habitat based upon a predictive model of general Forest communities and current knowledge of species habitat parameters within the AA. Species occupancy could be none or a very small percentage of these potential habitat acres. Table A-5 summarizes the results of this analysis within the 10,019 acre botanical AA.

**Table A-5: Impacts (Alternative C) Upon Potential Habitat for T&E & S Plant Species within Botanical A.A**

Species	Natural Community or Habitat	Estimated acres within Botanical AA	Acres Affected by Proposal
<b>Federally Threatened or Endangered Plant Species (T&amp;E)</b>			
<i>Spiraea virginiana</i>	Sandy areas adjacent to large rivers.	Unknown	Not Affected
<b>2002 Region 8 Regional Forester’s Sensitive Plant Species</b>			
<i>Aconitum reclinatum</i>	Northern Hardwood Cove Forest, Boulderfield Forest, High Elevation Seep, Rich Cove Forest	39	Not Affected
<i>Buckleya distichophylla</i>	Hemlock Hardwood Forest, Acidic Cove Forest, Montane Acidic Cliff, Mesic Oak- Hickory	4202	46
<i>Coreopsis latifolia</i>	Rich Cove Forest, Northern Hardwood Cove Forest	39	Not Affected
<i>Delphinium exaltatum</i>	Rich Cove Forest, Grassy Bald, Glade,	39	Not Affected
<i>Diervilla rivularis</i>	Streamside, Acidic Cove Forest	3825	46
<i>Diplophyllum apiculatum</i> var. <i>taxifolioides</i>	Roadbank	38.2 linear miles	<1
<i>Euphorbia purpurea</i>	Northern Hardwood Forest, Rich Cove Forest, Mesic oak-hickory	416	Not Affected
<i>Helianthus</i>	Rich Cove Forest, Northern Hardwood Forest,	416	Not Affected

Species	Natural Community or Habitat	Estimated acres within Botanical AA	Acres Affected by Proposal
<i>glaucophyllus</i>	High Elevation Red Oak Forest, Mesic Oak-Hickory Forest, Roadside		
<i>Juglans cinerea</i>	Rich Cove Forest, Mesic Oak-Hickory, Montane Alluvial Forest	562	Not Affected
<i>Marsupella emarginata</i> var. <i>latiloba</i>	Spray Cliff	< 1	Not Affected
<i>Penstemon smallii</i>	Montane Acidic Cliff	<1	Not Affected
<i>Saxifraga caroliniana</i>	Northern Hardwood Forest, Montane Acidic Cliff, High Elevation Rocky Summit	<1	Not Affected
<i>Scutellaria saxatilis</i>	Northern Hardwood Forest, Boulderfield Forest, Rich Cove Forest	39	Not Affected
<i>Silene ovata</i>	Rich Cove Forest, Mesic Oak-Hickory, Roadside, mafic rock	416	Not Affected
<i>Thermopsis fraxinifolia</i>	Xeric Oak-Hickory Forest, Montane Oak Woodland, Pine-Oak/Heath	4992	141
<i>Trillium rugelii</i>	Rich Cove Forest, low elevation	39	Not Affected
<i>Tsuga caroliniana</i>	Carolina Hemlock Forest, Montane Acidic Cliff, Pine-Oak/Heath, High Elevation Rocky Summit	4992	141

**Cumulative Effect**

The cumulative effect to potential habitat is the total affect of past, current, and foreseeable actions within the botanical AA that have directly or indirectly affected T&E, S, and FC plant species potential habitat. Within the botanical AA, only timber harvest and controlled burns are thought to have important influence on habitat. All other activities are minor and not analyzed. Past Actions analyzed include: Murphy Timber (private) sale (2006), White Oak Timber Sale (1992), Sunshine/ Bowling Green Timber Sale (1998), Flat Top control burn (2004), Bowling Green control burn (2002), Un-named burn (1997), and storm repair work along FSR roads.

Past timber harvest and clearing activities greater than 40 years old are thought to be recovered for forest species requiring more mature habitat conditions and unsuitable for species requiring early successional habitat. The following table (5) summarizes these effects of proposed harvest actions and past harvest actions less than 40 years old.

**Table A-6: Summary Cumulative Effect of Timber Harvest Upon Potential Suitable Habitat for TES Plant Species within Botanical A.A**

Federally Threatened or Endangered						
Habitat	Total Acres in AA	Associated Species	Past impact(s) (<40 years old)	Proposed impact(s)/ % of total	Future impact(s)	Total Impact/ % of Total Habitat in AA
Alluvial Forest, sandy areas near large rivers	unknown	<i>Spiraea virginiana</i>	None Known	None	None	None

Regionally Sensitive Plant Species Potential Habitat						
Habitat	Total Acres in AA	Associated Species	Past impact(s) (<40 years old) acres	Proposed impact(s)/ % of total	Future impact(s)	Total Impact/ % of Total Habitat in AA
Acidic Cove Forest	3,825	<i>Buckleya distichophylla</i> , <i>Diervilla rivularis</i>	310	46	None known	356
Rich Cove Forest	39	<i>Trillium rugellii</i> , <i>Juglans cinerea</i> <i>Helianthus glaucophyllus</i> <i>Coreopsis latifolia</i> , <i>Aconitum reclinatum</i> , <i>Delphinium exaltatum</i> , <i>Euphorbia purpurea</i> , <i>Scutellaria saxatilis</i>	none	none	None known	none
Pine Oak Heath/ Chestnut Oak Forest	4,992	<i>Monotropsis oderata</i> <i>Robinia hispida</i> var. <i>fertilis</i> , <i>Thermopsis fraxinifolia</i> <i>Tsuga caroliniana</i>	338	106	None known	444
Montane Oak Hickory	377	<i>Buckleya distichophylla</i> , <i>Euphorbia purpurea</i> , <i>Juglans cinerea</i>	55	none	None known	55
Alluvial Forest and gorge communities	146	<i>Saxifraga caroliniana</i> , <i>Penstemon smallii</i>	None known	none	None known	Habitat not affected
Water Fall Spray Zones & wet rocks	<1 acre	<i>Marsupella emarginata</i> var. <i>latiloba</i>	None known	none	None known	Habitat not affected

## B. EFFECTS/IMPACTS TO TES WILDLIFE SPECIES

***Plethodon welleri*, Weller's Salamander**, has been found during surveys of the activity areas within proposed unit 68-5. This salamander has four EO records within this AA ranging from south of FSR 278 to the eastern record on Unaka Mountain.

There were nine EOs within North Carolina prior to this survey, with the majority of them located within this AA from the top of Flat Top Mountain to Unaka Mountain. Another known location is at the base of these mountains, within a recreation area, on the Cherokee National Forest in Tennessee. The clustered aspect of these records indicates that this may be a large population covering several thousand acres, where habitat is present.

### Direct/ Indirect Impacts

In Alternative C unit 68-5 has not been proposed for any harvest activity. Therefore, Alternatives C would have no direct or indirect impact on the known populations or its habitat.

## Cumulative Impacts

Past timber sales have been at lower elevations than the location of EOs. The prescribed burn that has been carried out within the area of two of these EOs would not have affected the large woody debris where this salamander lives and lays its eggs. The burn was carried out in late winter/early spring when the salamander would not be active and would have been protected by the large woody debris which any prescribe fire would not affect. Potential mortality of hemlocks across the area would improve large woody debris conditions; however, the hemlock component cooling the forest floor would be lost. The private timber sale is at a lower elevation than the known EOs and this new record location. No further past and foreseeable future activities would affect the salamander or its habitat.

## C. EFFECTS/IMPACTS TO TES AQUATIC SPECIES

There were no aquatic TES found during activity area surveys within the Shinwhite Project area. However, one threatened and 2 sensitive species are included in this analysis due to their habitat preferences and the presence of this habitat within the Aquatic analysis areas.

### **Federally Threatened Appalachian Elktoe (*Alasmidonta varicosa*)**

#### Direct and Indirect Effects

Habitat for *Alasmidonta varicosa* exists within the aquatic analysis area of the Nolichucky River. EOs exist for this species and surveys last year by the NCHP indicate that this species still exists within this river reach. Since there are no stream crossings planned for the Shinwhite Project and there would be no cutting of timber within 100 foot riparian areas, there would be no direct or indirect impacts to *Alasmidonta varicosa* or habitat within the Nolichucky River.

#### Cumulative Effects

There would be no cumulative effects to *Alasmidonta varicosa* or habitat for this species as a result of the implementation of the Shinwhite Project. No risk to population viability across the Forest would occur as a result of the implementation of this project.

### **Sensitive Sharphead Darter (*Etheostoma acuticeps*) and Olive Darter (*Percina squamata*)**

#### Direct and Indirect Effects

Habitat for *Etheostoma acuticeps* and *Percina squamata* exists within the aquatic analysis area of the Nolichucky River. EOs as well as recent survey data indicate that these species still exist within this section of the Nolichucky River. There would be no direct or indirect impacts to these two sensitive species because the Shinwhite Project does not propose any new stream crossings or would not cut within the 100 foot riparian area of any tributaries to the Nolichucky River.

## Cumulative Effects

There would be no cumulative effects to *Etheostoma acuticeps* and *Percina squamata* or habitat for these species as a result of the implementation of the Shinwhite Project. No risk to population viability across the Forest would occur as a result of the implementation of this project.

## VI. PROJECT DESIGN FEATURES/ REQUIRED MITIGATION

### Botanical Species

The preferred alternative needs no specific project design features needed to protect TES plant species. There are no mitigation measures recommended for TES plant species.

### Terrestrial Species

The preferred alternative needs no specific project design features needed to protect TES wildlife species. There are no mitigation measures recommended for TES wildlife species.

### Aquatic Species

Project design features for protection of aquatic resources are sufficient to protect all regionally sensitive species (see section 2.4, Chapter 2, and section 4.1.7, aquatic analysis, project record for detail of measures). No specific project design features are recommended for TES aquatic species.

## VII. DETERMINATION OF EFFECT

This proposal would have no effect upon any federally listed (T&E) species. No T&E species or their habitat is known to occur in or near enough the proposed activities to be affected by this proposal. There is no occupied or unoccupied habitat recognized as essential for listed or proposed species recovery, or to meet Forest Service objectives for S species. Formal consultation with the USDI Fish and Wildlife Service is not required.

This proposal would be no impacts to any population of the Regional Forester's Sensitive species.

### Prepared by

/s/ David Danley

July 2, 2006

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## Attachment A-1

These tables are a compilation of 1) North Carolina Natural Heritage biological data base, 2) USFWS records, or 3) recent occurrence not in data base.

### Botanical – T&E, S, or FC plant species of Yancey & Mitchell Counties

#### Federally Listed Plant Species

Occurrence	Species	Natural Communities, Habitat
4	<i>Geum radiatum</i>	High elevation rocky summit
4	<i>Gymnoderma lineare</i>	High elevation rocky summit
4	<i>Houstonia montana</i>	High elevation rocky summit
2*	<i>Spirea virginiana</i>	Sandy areas near large rivers

#### Regional Sensitive Plant Species

Occurrence	Species	Natural Communities, Habitat
3*	<i>Aconitum reclinatum</i>	Northern Hardwood Cove Forest, Boulderfield Forest, High Elevation Seep, Rich Cove Forest
4	<i>Acrobolbus ciliatus</i>	Spruce-Fir Forest, Spray Cliff
4	<i>Bazzania nudicaulis</i>	Spruce-Fir Forest
4	<i>Brachydontium trichodes</i>	Spruce-Fir Forest
2*	<i>Buckleya distichophylla</i>	Hemlock Hardwood Forest, Acidic Cove Forest, Montane Acidic Cliff, Mesic Oak-Hickory
4	<i>Calamagrostis cainii</i>	High Elevation Rocky Summit
4	<i>Cardamine clematitidis</i>	Boulderfield Forest, Northern Hardwood Cove Forest, Spruce-Fir Forest, High Elevation Seep
4	<i>Carex misera</i>	High Elevation Rocky Summit, Montane Acidic Cliff, High Elevation Granitic Dome
4	<i>Carex roanensis</i>	Rich Cove Forest, Montane Oak-Hickory
4	<i>Chelone cuthbertii</i>	Southern Appalachian Bog
3*	<i>Coreopsis latifolia</i>	Rich Cove Forest, Northern Hardwood Cove Forest
3*	<i>Delphinium exaltatum</i>	Rich Cove Forest, Grassy Bald, Glade, Montane Oak-Hickory, mafic rock
3*	<i>Diervilla rivularis</i>	Streamside, Acidic Cove Forest
3*	<i>Diplophyllum apiculatum</i> var. <i>taxifolioides</i>	Roadbank
3*	<i>Euphorbia purpurea</i>	Northern Hardwood Forest, Rich Cove Forest, Mesic oak-hickory
4	<i>Frullania oakesiana</i>	Spruce-Fir Forest
4	<i>Gentiana austromontana</i>	Grassy Bald, High Elevation Red Oak Forest, Northern Hardwood Forest
4	<i>Geum geniculatum</i>	Boulderfield Forest, High Elevation Seep
3*	<i>Helianthus glaucophyllus</i>	Rich Cove Forest, Northern Hardwood Forest, High Elevation Red Oak Forest, Mesic Oak-Hickory Forest, Roadside
4	<i>Hypericum graveolens</i>	High Elevation Seep, Wet Meadow
4	<i>Hypericum mitchellianum</i>	High Elevation Seep, Wet Meadow
4	<i>Hypotrachyna virginica</i>	High Elevation Forest
3*	<i>Juglans cinerea</i>	Rich Cove Forest, Mesic Oak-Hickory, Montane Alluvial Forest
4	<i>Leptohymerium sharpii</i>	Spruce-Fir Forest
4	<i>Lilium grayi</i>	Northern Hardwood Forest, High Elevation Seep, Grassy Bald, Wet Meadow

Occurrence	Species	Natural Communities, Habitat
3*	<i>Marsupella emarginata</i> var. <i>latiloba</i>	Spray Cliff
4	<i>Metzgeria fruticulosa</i>	High Elevation Forest
3*	<i>Penstemon smallii</i>	Montane Acidic Cliff
4	<i>Plagiochila austinii</i>	Moist Montane Acidic Cliff
4	<i>Plagiochila caduciloba</i>	Spray Cliff, Streamside, Rock Outcrop in Acidic Cove Forest in Gorge
4	<i>Plagiochila sharpii</i>	High Elevation Rocky Summit, Rock Outcrop in Acidic Cove Forest in Gorge
4	<i>Plagiochila sullivantii</i> var. <i>sullivantii</i>	Spray Cliff, Spruce-Fir Forest
4	<i>Polytrichum appalachianum</i>	Rocky Summits, mid to high elevation
4	<i>Prenanthes roanensis</i>	Northern Hardwood Forest, Grassy Bald, Meadow, Roadside, High Elevation Red Oak Forest
4	<i>Rhododendron vaseyi</i>	Northern Hardwood Forest, High Elevation Seep, Southern Appalachian Bog, Meadow, Roadside
4	<i>Robinia viscosa</i> var. <i>hartwegii</i>	High Elevation Granitic Dome
4	<i>Robinia viscosa</i> var. <i>viscosa</i>	High Elevation Granitic Dome, woodlands
4	<i>Saxifraga caroliniana</i>	Northern Hardwood Forest, Montane Acidic Cliff, High Elevation Rocky Summit
4	<i>Scutellaria arguta</i>	Boulderfield Forest
3	<i>Scutellaria saxatilis</i>	Northern Hardwood Forest, Boulderfield Forest, Rich Cove Forest
3	<i>Silene ovata</i>	Rich Cove Forest, Mesic Oak-Hickory, Roadside, mafic rock
4	<i>Sphagnum flavicomans</i>	Seeps on Rock or Spray Cliffs
4	<i>Sphenolobopsis pearsonii</i>	Fraser-Fir Forest
3*	<i>Thermopsis fraxinifolia</i>	Xeric Oak-Hickory Forest, Montane Oak Woodland, Pine-Oak/Heath
3*	<i>Trillium rugelii</i>	Rich Cove Forest, low elevation
2*	<i>Tsuga caroliniana</i>	Carolina Hemlock Forest, Montane Acidic Cliff, Pine-Oak/Heath, High Elevation Rocky Summit
4	<i>Xanthoparmelia monticola</i>	High Elevation Rocky Summit

\*=Analyzed in BE

1=known to occur within activity area

2=known to occur in biological, botanical AA but not within activity area

3=not known to occur within activity area or biological, botanical AA but may contain habitat for species

4=not known to occur within biological, botanical AA and no habitat is known to occur within biological, botanical AA. Not further analyzed.

## Wildlife – TES Wildlife Species in Mitchell and Yancey Counties

Species	Habitat	Type & Status	Reason for Elimination
<i>Corynorhinus town. Virginianus</i> , VA big-eared bat	Caves within forested habitat	Mammal, E	No known caves/mines within activity areas Caves/mines protected if they occur
<i>Micotus chrotorrhinus carolinensis</i> , Southern rock vole	Rocky/boulder field within forest	Mammal, S	No habitat within activity area
<i>Myotis leibii</i> , Small-footed myotis	Winter – caves, mines, similar habitats Summer – hollow trees	Mammal, S	No habitat within activity areas
<i>Glaucmys sabrinus</i>	Mature spruce/fir & N.	Mammal, E	No spruce/fir within activity

Species	Habitat	Type & Status	Reason for Elimination
<i>coloratus</i> , Carolina northern flying squirrel	hardwoods, generally above 4000' elevation		area, N. hardwoods sporadic
<i>Felis concolor cougaur</i> , Eastern cougar	Remote habitats within mountains	Mammal, E	Believed extirpated
<i>Plethodon welleri</i>	Forest litter within deciduous forests with some Rhododendron	Salamander, S	*Record within unit 68-5 (alt.B)
<i>Clemmys muhlenbergii</i> , Bog turtle	Marshy meadows, large seeps, and bogs	Reptile, T	No habitat within activity areas

### Aquatic – Known and Proposed TES Species in Mitchell and Yancey County

Species	Type	Habitat	Occurrence
<b>Federally Threatened and Endangered Species</b>			
* <i>Alasmidonta raveneliana</i> (Appalachian elktoe)	Mussel	Lotic-fast, clean substrate rivers	May occur in the aquatic AA of the Nolichucky River
<b>2002 Region 8 Regional Forester's Sensitive Species List</b>			
<i>Stygobromus carolinensis</i> (Yancey Sideswimmer)	Crustacean	Seeps at Mt. Mitchell	Does not occur
* <i>Etheostoma acuticeps</i> (Sharphead darter)	Fish	Lotic-streams in the Nolichucky River system (Toe and Cane Rivers)	Likely to occur in the Nolichucky River within the aquatic AA
<i>Percina burtoni</i> (Blotchside darter)	Fish	Lotic-South Toe River	Does not occur within activity or AA
* <i>Percina squamata</i> (Olive darter)	Fish	Lotic-streams within the Tennessee Drainage	Likely to occur in the Nolichucky River within the aquatic AA

\* considered further in this analysis

## Definitions

Threatened, or Endangered (T&E) is a species that has been listed or is proposed for listing by the United States Fish and Wildlife Service. These species are included in every BE conducted for projects where the species is known to, likely to, or may occur. These species are also included in projects where the species occurred historically but hasn't been found during recent surveys.

Sensitive species (S) is a species appearing on the Regional Forester's Sensitive Species List for the Southern Region (August 7, 2001). These species are included in every BE conducted for projects within an area where the species is known to, likely to, or may occur.

Known to occur: those species in which there are records that they exist within a specified area, or it was found in the area during project specific surveys.

Likely to occur: those species in which there is no documentation of the species occurring in a specified area but are expected to occur based on documentation of very similar habitat to known

populations. For purposes of the BE, it should be assumed that the species does occur in specified area until presence/absence of the species is verified.

May (could) occur: the species probably occurs in a specified area in the broadest sense. Only very general habitat preferences and species distribution are used to determine if a species may occur. This does not imply their existence in an area, but that their general habitat description is found in the area, so therefore the species may occur. See the attached resource reports for “may occur”.

Forest Plan Analysis Area (AA): 4<sup>th</sup> order watersheds as determined by the Forest Plan.

Biological Analysis Area: The maximum geographic boundary where cumulative biological effects of analyses from past, present, and reasonably foreseeable actions are expected to be combined with effects from the proposal. Analysis areas are specific to individual resources and may be different boundaries. For the Shadline project, the wildlife biological AA is Forest Plan AAs 13 (Rich Mountain and Mill Ridge) and 14 (Polecat); the botanical biological AA is Compartments 420, 421, 422, 423, 424, 425, 426, 428, and 429; and the aquatic biological AA is the Forest Plan AAs

Management Area: Forest Plan designated areas with specific management objectives, standards, and guidelines.

Project Area: The general location identified by the Responsible Official where actions are proposed.

Activity Area: The geographic boundary where direct effects of the proposal would specifically occur, i.e. specific timber stands, haul routes, temporary roads, linear wildlife fields, trails, prescribed fire, areas where invasive exotic species would be treated, etc. and would change by alternative.

Coldwater Streams: Are usually defined as those with maximum temperatures of 68 degrees F or less. In North Carolina, these streams are largely ground-water fed, have relatively stable flows and generally elevations of 1,100 feet or more. They have gradients that are steep with stable banks. Boulder-rubble dominates their bottoms, and their turbidity is low. Productivity is usually limited.

Coolwater Streams: Represent the transitional community between coldwater streams and warmwater streams. Components of the community may include elements of both coldwater and warmwater habitats.

Warmwater Streams: Are characterized by having annual maximum temperatures greater than 68 degrees F.

## **APPENDIX B – AGE CLASS DISTRIBUTION**

## APPENDIX B – AGE CLASS DISTRIBUTION

The Shinwhite proposal extends across the administrative watershed or analysis area (AA) 7, referred to as the Nolichucky AA, which includes compartments 57, 59, 61 and 63-76. This AA is dominated by management areas that are suitable for timber production.

In the areas suitable for timber production both analysis areas are dominated by Management Area (MA) 1B or 3B, timber emphasis (Forest Plan, page III-71). The age-class distribution for both areas are unbalanced for MA 3B.

This analysis determines the minimum and maximum harvest levels for the proposal according to the Forest Plan.

### Forest Plan Direction for Distribution of Early Successional Habitat

The Forest Plan contains specific desired conditions for the amount of 0-10 year age-class in management areas with timber production (Forest Plan, pages III, 29-31). Regulation is at three scales: the watershed or topographic level; the management area within the watershed or topographic area; and the compartments within the area.

The tables below summarize existing 0-10 year age-class and regeneration goals for the Shinwhite proposal in AA 7 (Nolichucky). Uncut inclusions and non-forested areas are not considered as 0-10 year old regeneration.

#### Topographic or AA Analysis

For every AA with at least 250 acres in MAs 1B, 2A, 3B, 4A and/or 4D, the number of acres in each management area is multiplied by the maximum percent allowed and then summed to determine the amount of 0-10 year age-class allowed in the AA.

**Table B-1: AA 7 Calculations 0-10 Year Age-Class**

		0-10 YEAR AGE CLASS			HARVEST GOALS		SHINWHITE PROPOSAL	
AA 7	Suitable Acres	Min. Desired	Max. Allowed	Existing 0-10 Yr.	Min.	Max.	Proposed Harvest Acres	Percent* 0-10 Yr
7 Nolichucky	4,879	244	732				195	4

\* percentages of forested acres in 1B, 2A, 3B, 4A, or 4D

#### Management Area Analysis

For every MA with at least 250 acres in the analysis area, the amount of 0-10 year age-class allowed in the management area is calculated by multiplying the number of acres in each management area in the analysis area by the maximum percent allowed. Each result is the amount of 0-10 year age-class allowed in that management area.

**Table B-2: Management Area Calculations 0-10 Year Age-Class**

		0-10 YEAR AGE CLASS			HARVEST GOALS		SHINWHITE PROPOSAL	
MA	Forested Acres	Min. Desired	Max. Allowed	Existing 0-10 Yr.	Min.	Max.	Proposed Harvest Acres	Percent 0-10 Yr
2C	620	-	-		-	-	-	-
3B	4,879	244	732	95	149	637	195	6
4C	459	-	-		-	-	-	-
5	3,282	-	-		-	-	-	-
12	11							
14	244	-	-		-	-	-	-
18	214	-	-		-	-	-	-
<b>Total</b>	<b>9,709</b>							-

**Compartment Area Analysis**

For every compartment with at least 250 acres in MA 1B, 2A, 3B, 4A, or 4D, the amount of 0-10 year age-class allowed in each compartment is calculated by determining which of the MA's has the most acres in the compartment (1B, 3B, 2A, 4A, or 4D). If 1B and 3B have the most, then the maximum allowed in the 0-10 year age-class is 15 percent of all acres in the compartment. If 2A, 4A, or 4D have the most acres, then the maximum amount allowed in the 0 – 10 year age-class is 10 percent of all acres in the compartment. The following table display the age-class by compartment:

**Table B-3: Nolichucky Analysis Area 7 Compartment 65 0-10 Year Age-Class**

		0-10 YEAR AGE CLASS			HARVEST GOALS		SHINWHITE PROPOSAL	
MA	Forested Acres	Min. Desired	Max. Allowed	Existing 0-10 Yr.	Min.	Max.	Proposed Harvest Acres	Percent 0-10 Yr
3B	782	39	117	0	39	117	100	13

**Table B-4: Nolichucky Analysis Area 7 Compartment 68 0-10 Year Age-Class**

		0-10 YEAR AGE CLASS			HARVEST GOALS		SHINWHITE PROPOSAL	
MA	Forested Acres	Min. Desired	Max. Allowed	Existing 0-10 Yr.	Min.	Max.	Proposed Harvest Acres	Percent 0-10 Yr
3B	626	31	94	65	0	29	24	14
14	33	-	-	-	-	-	-	-

**Table B-5: Nolichucky Analysis Area 7 Compartment 69 0-10 Year Age-Class**

		0-10 YEAR AGE CLASS			HARVEST GOALS		SHINWHITE PROPOSAL	
MA	Forested Acres	Min. Desired	Max. Allowed	Existing 0-10 Yr.	Min.	Max.	Proposed Harvest Acres	Percent 0-10 Yr
3B	176	18	26	5	13	21	21*	15
5	121	-	-	-	-	-	-	-

**Table B-6: Nolichucky Analysis Area 7 Compartment 70 0-10 Year Age-Class**

		0-10 YEAR AGE CLASS			HARVEST GOALS		SHINWHITE PROPOSAL	
MA	Forested Acres	Min. Desired	Max. Allowed	Existing 0-10 Yr.	Min.	Max.	Proposed Harvest Acres	Percent 0-10 Yr
3B	335	17	50	25	-	25	50*	15
5	133	-	-	-	-	-	-	-

## **APPENDIX C – OLD GROWTH ANALYSIS**

## APPENDIX C – OLD GROWTH RESTORATION

### Forest Plan Direction for Old Growth Restoration Patches

The Forest Plan contains specific directions for designating large, medium, and small old growth restoration patches (Forest Plan, pages III-26 – III-28). The administrative watershed, or analysis area (AA) affected by this proposal is 7 (Nolichucky). The requirements for this project are as follows: (1) utilize large patch #21 (2) select small patch, if needed, for Compartments 65; and (3) field check stands in the initial inventory of old growth that would be directly affected by this project.

#### Large Patch #21

The purpose of the large patches is to serve as permanent reservoirs of biological diversity and to provide preferred habitats for forest interior birds across the landscape. Distribution of old growth types for large patch #21 are shown below:

**Table C-1: Distribution of Old Growth Types for Large Patch #21**

Old Growth Code	Old Growth Type	Acres	% of Patch
	Cove Hardwoods	1,300	45
	Upland Hardwoods	1,100	40
	White Pine	100	4
	Northern Hardwoods	300	11
<b>Total</b>		<b>2,800</b>	<b>100</b>

#### Initial Inventory of Old Growth and Small Patch Designation

There are several patches of initial inventory old growth identified in the Forest Plan. In Compartments 69 and 70, there is a large patch of old growth designation (Large Patch #21). No small patch old growth would be designated within these compartments in this proposal.

The purpose of the **small patches** is to increase biological diversity and to provide structural components of old growth at the stand and landscape levels. There are currently no small old growth patches in either watershed. The proposal for old growth is the same in the action alternatives. The following stands would be designated as small patches for long-term old growth retention to meet Forest Plan standards for old growth.

**Table C-2: Initial Old Growth Patches Proposed in Nolichucky AA**

Comp.	Acres	Stands	Age in 2005	Initial Inv.?	Forest Type
65	70	14,16,17	96,96,110	yes	4,4,56
68	54	21,26	117	yes	53,56

## **APPENDIX D – APPROPRIATENESS OF HARVEST METHODS**

## APPENDIX D – APPROPRIATENESS OF HARVEST METHODS

Regeneration methods were discussed at length in Appendix E of the FEIS for the Forest Plan, and on pages E1-E2 in Amendment 5 of the Forest Plan. Choices include shelterwood cutting and clearcutting (even-aged management system), two-age (two-aged system), and group selection (uneven-aged system). At this time, single-tree selection (uneven-aged management) is not being considered as appropriate in meeting long-term regeneration needs to sustain productive stands of desirable tree species except in northern hardwood (beech-birch-sugar maple) or hemlock stands (all shade tolerant species). This is because regeneration objectives would not be met and single-tree selection does not work with shade intolerant species as occur in the Sugarloaf or Shelton Laurel analysis areas. Thinning and sanitation cutting may also occur, but they are intermediate treatments not meant to establish regeneration.

With any method, there must be enough quantity and quality of timber to be removed to make a sale operable, i.e. economically feasible to log at a given stumpage price (stumpage is the price paid for standing timber). The minimum quantity would generally be three thousand board feet of sawtimber per acre, although markets may develop for lower value products. Sawtimber would be defined as trees that are large enough, free enough of defects, and of commercially valuable species which could be sawed into grade 3 or better lumber. Some species like scarlet oak seldom contain any grade 3 logs because of defect. Other species like sourwood seldom reach large enough diameter to become sawtimber. Changes in markets may change operability standards in a local area as well as affecting stumpage price.

Operability and stumpage price are also affected by transportation cost, logging cost, and size of the area being logged. Costs of getting logs from the stump to the mill are higher for timber in remote areas, where haul roads must be built, or for timber logged with specialized logging equipment, e.g. with cable systems or with a helicopter. As costs increase, prospective timber purchasers lower their bid prices on stumpage to compensate. If the price they can pay becomes less than the minimum acceptable stumpage price, the timber becomes inoperable (no one would buy it).

Each logging crew, depending on the size of their operation and the value of the timber to be logged, would have a minimum amount of timber that would be economical for them to move in and cut. For instance, in a given stand, it might be economical for a given logging crew to harvest a clearcut as small as 10 acres to obtain 50 MBF. If group selection is chosen, where only about 25 percent of the area is regenerated per entry, 40 acres would be needed to provide the crew with the same amount of sawtimber. Therefore, operability becomes an important factor in determining which regeneration methods are appropriate.

Much concern has been expressed over **clearcutting** as a management tool. Other regeneration methods would be used when management objectives can be met and when the other methods are economically feasible. In a memo to Regional Foresters dated June 4, 1992, the Chief of the Forest Service stated that "*Clearcutting would be limited to areas where it is essential to meet forest plan objectives and involve one or more of the following circumstances:*

1. *To establish, enhance, or maintain habitat for threatened, endangered, or sensitive species.*

2. *To enhance wildlife habitat or water yield values, or to provide for recreation, scenic vistas, utility lines, road corridors, facility sites, reservoirs, or similar development.*
3. *To rehabilitate lands adversely impacted by events such as fires, windstorms, or insect or disease infestations.*
4. *To preclude or minimize the occurrence of potentially adverse impacts or insect or disease infestations, windthrow, logging damage, or other factors affecting forest health.*
5. *To provide for the establishment and growth of desired trees or other vegetative species that are shade intolerant.*
6. *To rehabilitate poorly stocked stands due to past management practices or natural events.*
7. *To meet research needs.”*

These circumstances would be referred to on a site-specific basis when showing that clearcutting is optimum for a given stand.

Regeneration using the **group selection** method is appropriate where logging costs are relatively low and where there is enough volume and value in the stands to make selection cutting operable. Group selection is not traditionally done in very small stands or on slopes greater than 40 percent where cable logging is necessary, where timber volume or value is low, or in stands where insect or disease hazards are high and widespread. It is also not appropriate where partial cutting and leaving a white pine seed source would result in conversion of mixed pine/hardwood stands to almost pure pine stands, if the accompanying long-term loss of mast production would be detrimental to local wildlife populations.

The **shelterwood** method of regeneration has been traditionally used where a residual seed source was needed for stand establishment or where new seedlings developed best with partial shade or protection from exposure. In the Appalachian Mountain region, seed from reserve trees (or "leave trees") are usually not needed to establish a new stand, but visual concerns often make shelterwood desirable. Leave trees must be those that would not likely be windthrown after having the adjacent trees cut. The residual overstory of a new shelterwood cut would look more park-like with the biggest and best trees evenly distributed across the landscape, rather than having a denuded appearance like a fresh clearcut might have. Regeneration would become established under the residual overstory. Then, at some later time depending on objectives, all or part of the overstory may be removed so it would not hinder further growth and development of the new stand. Some damage to the regeneration would occur during the overstory removal. Shelterwood is not appropriate on slopes greater than 40 percent where cable logging is necessary unless timber volume and values are very high. Shelterwood is not appropriate in stands where leaving an overstory would make the stands inoperable, or in stands where insect or disease hazards are high and widespread. It is also not appropriate where partial cutting and leaving a white pine seed source would result in conversion of mixed pine/hardwood stands to almost pure pine stands, if the accompanying long-term loss of mast production would be detrimental to local wildlife populations.

The **two-age** regeneration method is similar to shelterwood except that overstory removal is deferred indefinitely or until another two-age cut can be done. This perpetuates at least two distinct ages of timber growing on the same site. Since leave trees do not have to support another operable sale, they do not have to be merchantable and not as many have to be left. The type of leave trees retained would depend on site-specific objectives. Basal area of leave trees should not exceed 20-30 sq ft/acre fifteen years after harvest so they would not hinder

further growth and development of the new stand. More than one harvest entry may be used to reduce basal area to this level. For example, a shelterwood removal could reduce basal area from 50 sq ft/ac to 15 sq ft/ac, thus perpetuating a two-aged stand. The two-age method is appropriate in operable stands on slopes less than 40 percent whenever there are enough leave trees that would live to be a part of the stand for 50-100 years into the future. Two-age could be appropriate to meet objectives other than timber production, e.g. if continuous acorn production is needed within a stand, or if den trees are scarce, or if aesthetics is a consideration. Two-age would be appropriate on slopes greater than 40 percent if timber value is high enough to offset increased costs of selective logging with cable systems, and if visual concerns or wildlife habitat objectives cannot be met by clearcutting. Two-age is not appropriate in stands where leaving an overstory would make the stands inoperable.

The following table describes factors to be considered in determining appropriateness of regeneration methods for each stand:

**Table D-1: Factors Considered in Determining Appropriate Regeneration Methods**

Compartment- Stand	Acres	Volume/Acre (CCF)	Timber Quality	Leave Trees	Future Removal	Access	Special Concerns
65-1	28	30.2	High	Y	No	Good	
65-3	35	15.9	Med	Y	No	Good	
65-6	29	24.2	High	Y	No	Good	
68-5 <sup>1</sup>	21	13.2	Med	Y	No	Good	Visual
69-5	23	18.8	Med	Y	No	Good	
70-8	14	12.4	Med	Y	No	Good	
70-9	36	9.5	Low	Y	No	Good	
<b>Total Harvest</b>	<b>186</b>						

- 1/ Timber Quality:
  - Very High = Northern Red Oak, White Oak, Black Cherry
  - High = Large White Pine, Yellow-poplar
  - Medium = Small Diameter Sawtimber, Mixed Oak
  - Low = Small Roundwood, Scarlet Oak, Yellow Pine
- 2/ Leave Trees:
  - Y = Well distributed, long-lived, meet objectives
  - Spotty = Available in clumps; not well distributed
  - N = Scarce, scattered, or high mortality risk
- 3/ Future Removal:
  - Yes = Potential for operable removal of overstory
  - No = Removal would not be operable within 10 years
- 4/ Access:
  - Cable = Slopes >40 percent require cable logging systems
  - Good = Less than 0.5 mile from existing haul road
  - Fair = 0.5-1.0 mile from existing haul road
  - Poor = Greater than 1.0 mile from existing haul road
- 5/ Special Concerns:
  - Conversion = Risk that oak component be lost to pine
  - Wildlife = Modify to provide needs for wildlife
  - Visual = Modify to mitigate aesthetic concerns
  - Insect/Disease = High risk of loss due to SPB and/or loss due to oak decline

The following table summarizes appropriate regeneration methods for each stand and what is proposed in each alternative:

**Table D-2: Appropriate Regeneration Method by Stand by Alternative**

Compt -Stand	Acres	Forest Type	Age	Method Of Logging	Selection (groups <1 ac)	Shelterwood BA 30-50	Two-Age BA 20-25
65-1	28	Cove Hwd.	76	Tractor			Yes B,C
65-3	35	Cove Hwd.	76	Tractor			Yes B
65-6	29	Cove Hwd.	81	Tractor			Yes B,C

Compt -Stand	Acres	Forest Type	Age	Method Of Logging	Selection (groups <1 ac)	Shelterwood BA 30-50	Two-Age BA 20-25
68-5 <sup>1</sup>	21	Up.Hwd/ Pine	76	Tractor			Yes B
69-5	23	White Pine/Hwd	61	Tractor			Yes B,C
70-8	14	Cove Hwd.	81	Tractor			Yes B
70-9	36	Cove Hwd.	81	Tractor			Yes B,C

## Timber Cutting Methods Considered

The following is a list of timber cutting methods which were considered in this analysis. A brief description is provided to help the reader understand these terms as they are used in this document:

### Cutting for Even-aged or Two-aged Regeneration

#### Clearcutting

Removal, in a single cutting, of older trees to establish a new stand of trees in a fully exposed microclimate. All merchantable trees on an area are harvested, and remaining trees are cut or killed in site preparation. This method would be used only when no other method is feasible.

#### Shelterwood Cutting

Similar to clearcutting, except some overstory trees are temporarily left well distributed across an area to accomplish some objective. Usually 20-40 sq ft/acre of basal area is left. Depending on diameter, this could be between 10 and 50 trees per acre (fewer large trees are required to reach a given basal area). Normally, only healthy, wind-firm trees are left as overwood. After a time, usually within 10 years, the overwood is removed by logging or by other means so that it does not impede development of the younger trees that were established after the shelterwood cut.

#### Two-Age Cutting

Similar to shelterwood cutting except fewer overstory trees are left in place, and they are not subsequently removed, so that two distinct ages of trees are maintained on the same site. Trees left as overwood should be long-lived since they may be expected to live 120 years or more (Beck 1986).

### Cutting to Establish Regeneration and Maintain at Least 3 Ages in an Area

#### Group Selection Cutting

Cutting small areas between 0.2 and 2.0 acre each, distributed over a large area, with the intent over time to establish three or more distinct age-classes. Width of an individual opening would be 1.5 - 2 times the height of trees adjacent to the opening. Small trees having good growth potential may be left standing within openings, and priority for openings would be where mature timber occurs. The number of openings would depend on the size of the area where selection would be used, the frequency of timber sale entry, and the desired age of the oldest trees. Intermediate harvests to improve the condition of the residual stand or to establish advance regeneration may be done between openings when needed.

## **Cutting to Anticipate Mortality and Improve the Growth and Vigor of the Remaining Trees without Regard for the Establishment of Regeneration**

### Free Thinning

Cutting trees that are diseased or damaged, suppressed by other trees or that are crowding other trees. The best trees in terms of species, size or quality are left to grow. Some minimum basal area is usually set using this type of timber stand improvement.

### Sanitation Thinning

Cutting trees that have been attacked or appear in imminent danger of attack from injurious agents (such as disease or insects) other than competition between trees. The best trees in terms of species or vigor are left to grow. No minimum basal area is set using this type of timber stand improvement.

### Selection Thinning

Cutting the larger trees in an area to improve the growth of the remaining trees, but leaving enough desirable, healthy trees to recapture the potential of the site and develop into larger merchantable trees themselves in a reasonable time. This may be done with yellow-poplar on a good site, but only once during a rotation (Beck 1988).

### **Other Terms Used:**

#### Advance Reproduction

Young trees, usually seedlings and saplings, growing in the understory of existing stands.

#### Rotation

The time between regeneration and final harvest.

#### Stand

A community of trees sufficiently uniform in composition, age, site productivity, spatial arrangement, or condition to be distinguishable from adjacent communities, thereby forming a silvicultural or management entity.

## **APPENDIX E – FINANCIAL EFFICIENCY**

## APPENDIX E – FINANCIAL EFFICIENCY

### Purpose

The purpose of the financial efficiency analysis is to present the estimated costs and revenues of the alternatives considered in the Environmental Analysis for the Proposed Shinwhite Timber Sale and Associated Activities, Appalachian Ranger District, Pisgah National Forest. As per Forest Service Handbook 2409.18, each timber sale in the project proposal expected to exceed \$100,000 in advertised value requires a financial analysis to determine financial efficiency.

### Assumptions

For the purpose of this analysis, the following assumptions would apply:

1. Discount Rate is 4%.
2. Inflation rate is 0% throughout the analysis period (60 years plus).
3. Estimated timber revenues were calculated using the base prices from the Pisgah and Nantahala National Forests 3<sup>rd</sup> Quarter Adjustment Sheet for Fiscal Year 2005 issued out of the Forest Supervisor's office in Asheville, North Carolina.
4. Sale preparation costs and timber harvest administration costs were obtained from budget figures for the 2005 National Forests in North Carolina. Sale preparation costs are approximately \$8.40/CCF and timber harvest administration costs are approximately \$4,800 per year of Sale (generally sale runs 3 years).
5. Reforestation and silvicultural treatment costs were taken from averages of actual contract costs on the Appalachian Ranger District plus an additional 25% to cover district preparation and administration costs.
6. Temporary road construction was estimated at \$5,000/mile.
7. A 60-year long-term projection was used for comparison basis only. Many of these stands would be carried for a longer rotation period.

### Limitations of Analysis

Any financial analysis must draw limitations on the amount of data to be included or the entire process would quickly become a mix of different alternatives and expected yields or losses. For instance, inflation rate is assumed to be 0% over the entire analysis period; a situation rarely encountered in the real world. The differences between the economic values of the alternatives remain the same, regardless of the inflation rate, so constant dollars were used for comparisons between alternatives.

### Financial Analysis Worksheets

**Table E-1: Sale Revenue Estimates for all Alternatives**

Alternative	Timber Volume (CCF)	Revenue
A	0	0
B	3,328	\$227,588
C	2,320	\$164,187

**Table E-2: Sale Cost Estimates – Alternative B**

Activity	Units	Number	Cost/Unit	Total Costs
Stand Examinations	Acres	2,000	\$10.00	\$20,000
Sale Preparation	CCF	3,328	\$8.40	\$27,955
Harvest Administration	Year	3	\$4,800	\$14,400
Site Preparation – Herbicide	Acres	186	\$175	\$32,550
Temporary Road Construction.	Miles	0.1	\$5,000	\$500
Pre-haul Maintenance	Miles	2.2	\$3,500	\$7,700
<b>Total</b>				<b>\$103,105</b>

**Table E-3: Benefit Cost Ratio – Alternative B**

Year	Discount Factor	Revenue	Cost	Present Net Value	Benefit Cost Ratio
0	0	\$227,588	\$103,105	\$124,183	2.21
60	0.096	\$21,848	\$9,898	\$11,950	2.21

**Table E-4: Sale Cost Estimates – Alternative C**

Activity	Units	Number	Cost/Unit	Total Costs
Stand Examinations	Acres	2,000	\$10.00	\$20,000
Sale Preparation	CCF	2,320	\$8.40	\$19,488
Harvest Administration	Year	3	\$4,800	\$14,400
Site Preparation – Herbicide	Acres	101	\$175	\$17,675
Pre-haul Maintenance	Miles	1.8	\$3,500	\$6,300
<b>Total</b>				<b>\$77,863</b>

**Table E-5: Benefit Cost Ratio – Alternative C**

Year	Discount Factor	Revenue	Cost	PNV	BCR
0	0	\$164,187	\$77,863	\$86,324	2.10
60	0.096	\$15,762	\$7,475	\$8,287	2.10

## Salability of Shinwhite Timber Sale

Salability is determined by accessibility of timber and current markets for timber. Shinwhite is accessible from Forest Service Road (FSR) 5570, FSR 5583 and FSR 5565. Temporary road construction and pre-haul maintenance is necessary to access one unit in Alternative B; however, temporary road construction costs are estimated to be approximately \$500, well below the value of the timber to be removed. No temporary road construction and pre-haul maintenance is necessary to access stands in Alternative C. The timber quality is medium within the proposed sale units. Market for quality timber is high within western North Carolina. Recent timber sales on the Pisgah National Forest show revenues have been higher than estimated—there are no problems anticipated in selling the Shinwhite timber sale if offered.

## **APPENDIX F – DESIGN FEATURES FOR HERBICIDE USE AND SPECIFIC TIMBER SALE CLAUSES**

## APPENDIX F – DESIGN FEATURES FOR HERBICIDE USE AND SPECIFIC TIMBER SALE CLAUSES

### Herbicide Application Design Features

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

14. Only the amount of herbicide needed for the day's use is brought to the site. At day's end, all leftover herbicide is returned to storage.
15. Herbicide mixing, loading, or cleaning areas in the field are not located within 200 feet of private land, open water or wells, or other sensitive areas
16. During use equipment to store, transport, mix, or apply herbicides is inspected daily for leaks.

### **Specific Timber Sale Clauses**

On June 19, 2006, a meeting took place with private landowners in the White Oaks area to discuss the Shinwhite proposal. The landowners expressed concern over safety/access management due the proposed timber sale. The timber sale would be implemented under a timber sale contract with specific clauses to ensure proper utilization and protection to resources. The following clauses would be part of a timber sale contract that may be awarded (additional clauses would also be part of the contract):

#### **B5.12 Use of Roads by Purchaser**

Except as provided herein, Purchaser is authorized to use existing National Forest roads, in addition to Specified Roads listed in A9, when such use would not cause damage to the roads or National Forest.

#### **B6.22 Protection of Improvements**

So far as practicable, Purchaser shall protect Specified Roads and other improvements (such as roads, trails, telephone lines, ditches, and fences): (a) Existing in the operating area, (b) Determined to have a continuing need or use, and (c) Designated on Sale Area Map. Roads and trails needed for fire protection or other purposes and designated on Sale Area Map shall be kept reasonably free of equipment and products, slash, and debris resulting from Purchaser's Operations. Purchaser shall make timely restoration of any such improvements damaged by Purchaser's Operations and, when necessary because of such operations, shall move such improvements, as specified in C6.22.

#### **B6.33 Safety**

Purchaser's Operations shall facilitate Forest Service's safe and practical inspection of Purchaser's Operations and conduct of other official duties on Sale Area. Purchaser has all responsibility for compliance with safety requirements for Purchaser's employees. In the event that Contracting Officer identifies a conflict between the requirements of this contract or agreed upon methods of proceeding hereunder and State or Federal safety requirements, the contract shall be modified and Purchaser may request an adjustment in Current Contract Rates to compensate for the changed conditions. Unless otherwise agreed in writing, when Purchaser's Operations are in progress adjacent to or on Forest Service controlled roads and trails open to public travel, Purchaser shall furnish, install, and maintain all temporary traffic controls that provide the user with adequate warning of hazardous or potentially hazardous conditions associated with Purchaser's Operations. Purchaser and Forest Service shall agree to a specific Traffic Control Plan for each individual project prior to commencing operations. Devices shall be appropriate to current conditions and shall be covered or removed when not needed. Except as otherwise agreed, flagmen and devices shall be as specified in the "Manual on Uniform Traffic

Control Devices for Streets and Highways” (MUTCD) and as shown on Plans, Sale Area Map, Traffic Control Plan, or in specifications attached hereto.

### **CT 6.7**

Slash is defined as all vegetative debris resulting from the Purchaser's operations, including limbs, tops, cull logs, bark, wood chunks, pushed-out stumps, damaged brush, and damaged residual trees. Tops from felled trees and all trees to be removed from roads, landings, or other construction clearings shall be completely felled and not left leaning or hanging in other trees. Slash associated with construction of Specified Roads is construction slash subject to treatment according to road construction specifications.

#### **Other Ownership**

The Purchaser shall conduct operations so that slash does not enter non-National Forest System lands, as shown on Sale Area Map. In event slash is deposited on other ownership, the Purchaser shall immediately remove such slash. The Contracting Officer may agree in writing to other treatment requirements if the Purchaser provides a written slash disposal agreement between the Purchaser and the landowner.

#### **Roads and Other Clearings**

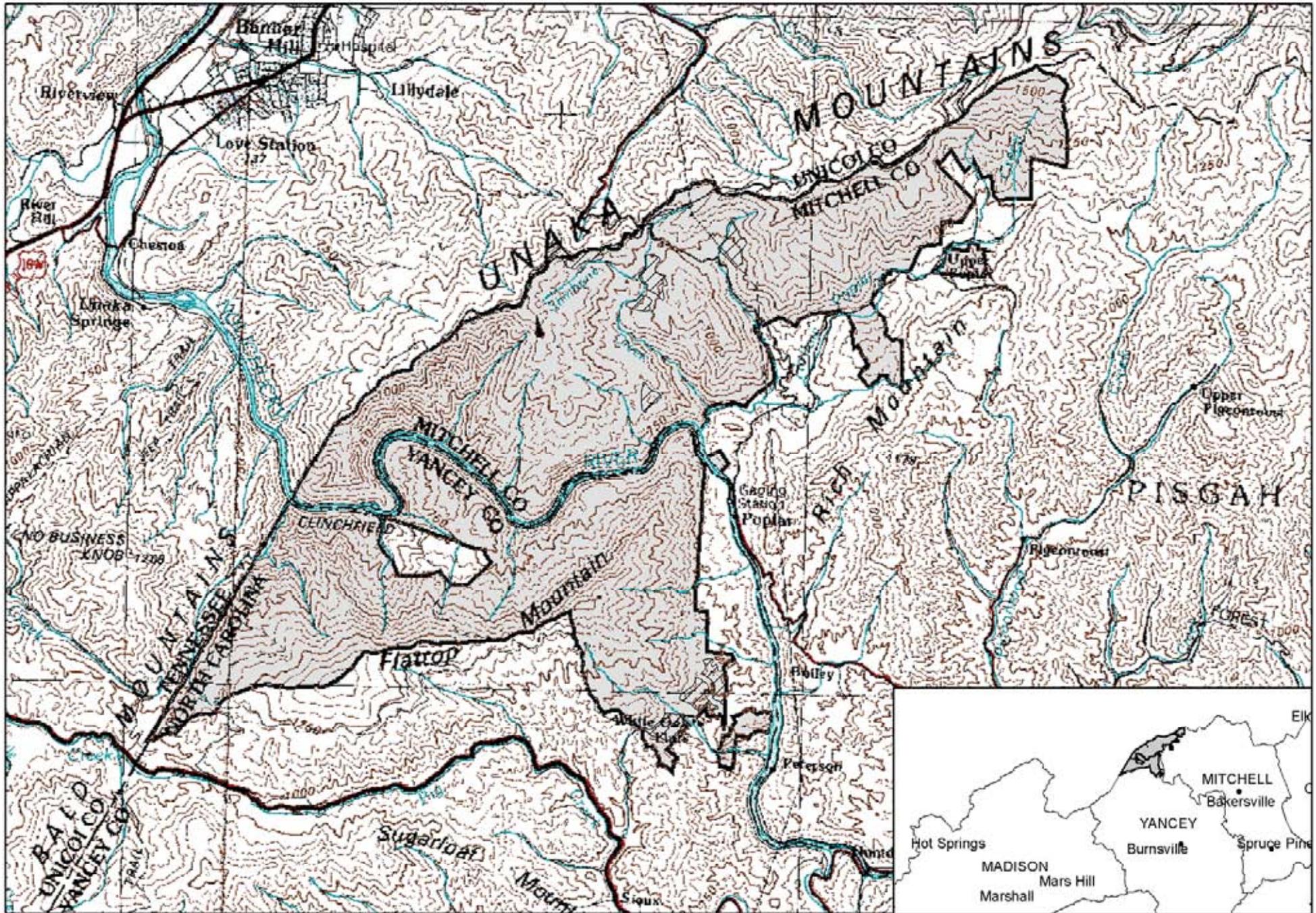
Along roads available for public use the Purchaser shall immediately remove slash from traveled surfaces, shoulders, and drainage facilities. Other slash along roads available for public use and all slash along roads not available for public use shall be removed from the clearing limits within four days after adjacent skidding or yarding to each landing is complete. In areas where skidding or yarding is delayed or interrupted, slash shall be removed within ten days after being created. Trails open to public use shall be kept free of slash. Slash within the clearing limits of powerlines, telephone lines, pipelines, and similar clearings shall be removed within ten days after adjacent skidding or yarding to each landing is substantially complete. Slash removed from roads and other clearings shall be scattered outside the clearing limits, or otherwise disposed of as agreed. The time requirements for completion of slash removal may be changed by written agreement, except where immediate removal is required.

#### **Other Treatment Areas**

The Purchaser shall complete slash treatment in other areas as described below. The Forest Service and the Purchaser shall jointly agree to a schedule for completion of such slash treatment, which shall be included in the Purchaser's Annual Operating Schedule required under BT6.31. N/A At or adjacent to log landings, delimiting areas, and similar areas of slash accumulation within N/A, concentrations of slash greater than N/A feet in height and N/A feet in length, measured at greatest distances, shall be N/A. Slash treatments described below are required at locations shown on the Sale Area Map by the following symbols: See Table CT6.7# - Slash Disposal, Slash Disposal Requirements Table.

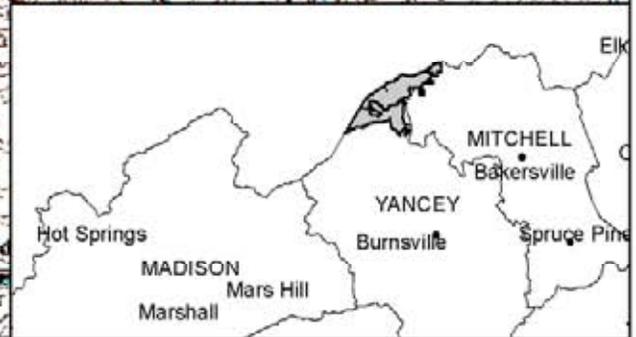
## **SHINWHITE PROJECT MAPS**

# Shinwhite Proposal Vicinity Map



## Legend

- Nolichucky Analysis Area
- Proposed 2 Age Harvest

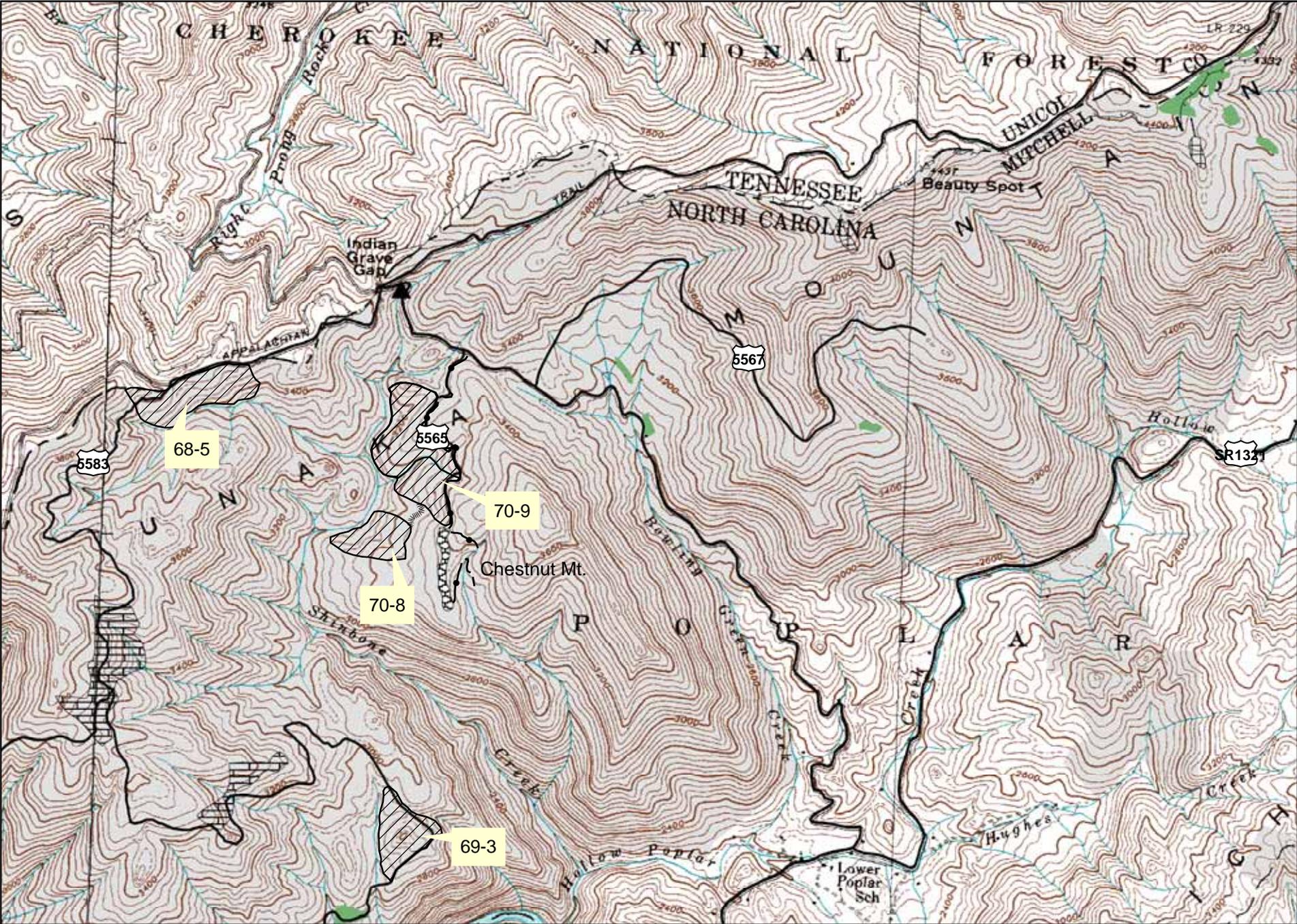


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Map prepared by LR 12/05

# Shinwhite Project Alternative B Map 3

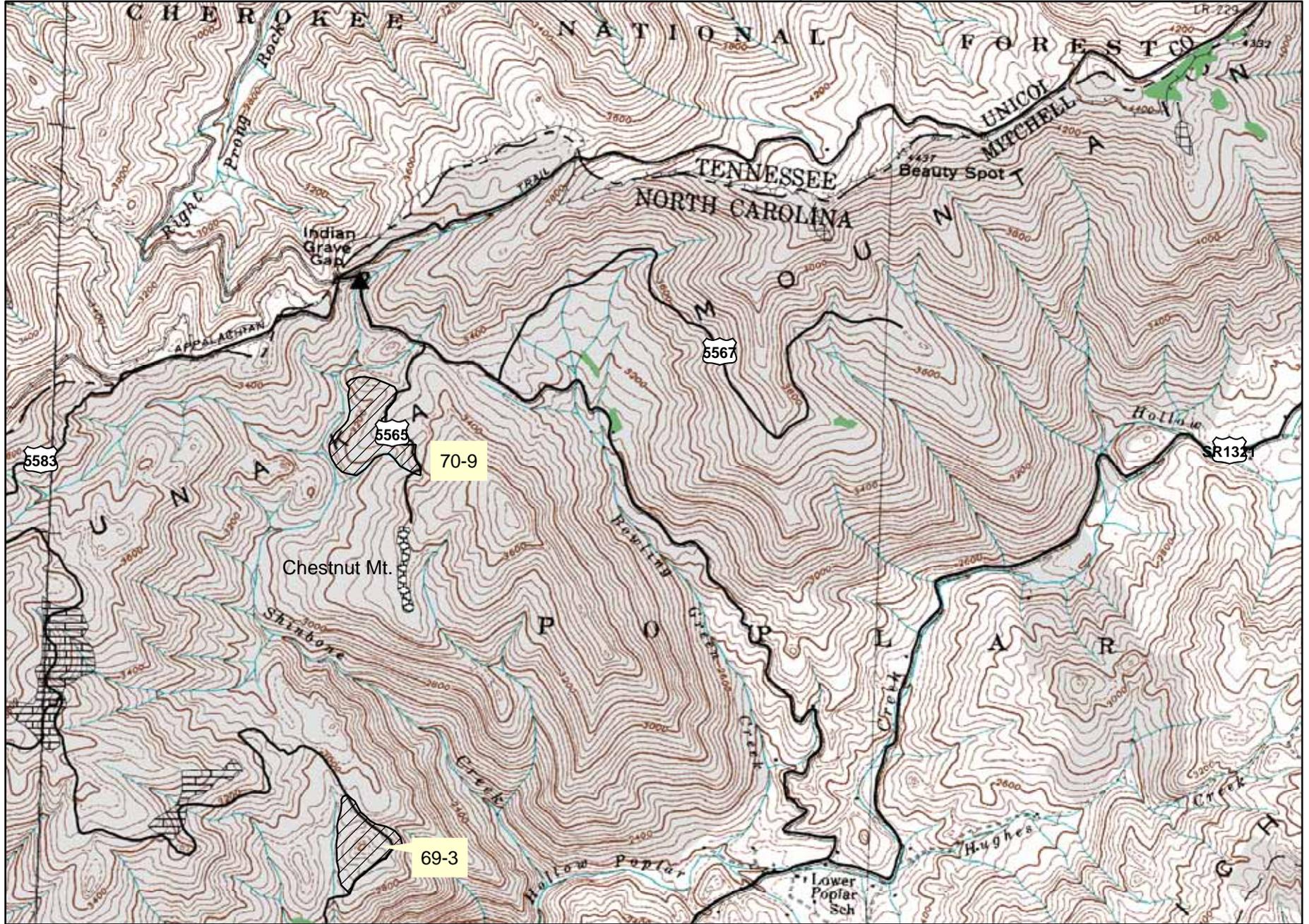


<ul style="list-style-type: none"> <li> Proposed 2 Age Harvest</li> <li> Temporary Road (Between Units 70-9 and 70-8)</li> </ul>	<ul style="list-style-type: none"> <li> Proposed Daylighting Linear Wildlife Openings</li> <li> Soil and Water Project</li> </ul>	<ul style="list-style-type: none"> <li> Proposed New Wildlife Openings</li> <li> Proposed Daylighting Wildlife openings</li> </ul>	<ul style="list-style-type: none"> <li> Small Patch Old Growth Proposal</li> <li> Wildlife Openings</li> <li> Appalachian Trail</li> <li> FS ownership</li> <li> Roads</li> </ul>
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All roads, trails and wildlife linear and field openings are proposed for herbicide treatment of invasive exotic plants.



# Shinwhite Project Alternative C Map 5



- |  |                                |                                 |                   |              |
|--|--------------------------------|---------------------------------|-------------------|--------------|
| Proposed 2 Age Harvest                 | Proposed New Wildlife Openings | Small Patch Old Growth Proposal | Appalachian Trail | FS ownership |
| Proposed Daylighting Wildlife openings | Roads                          | Soil and Water Project          | Wildlife Openings |              |

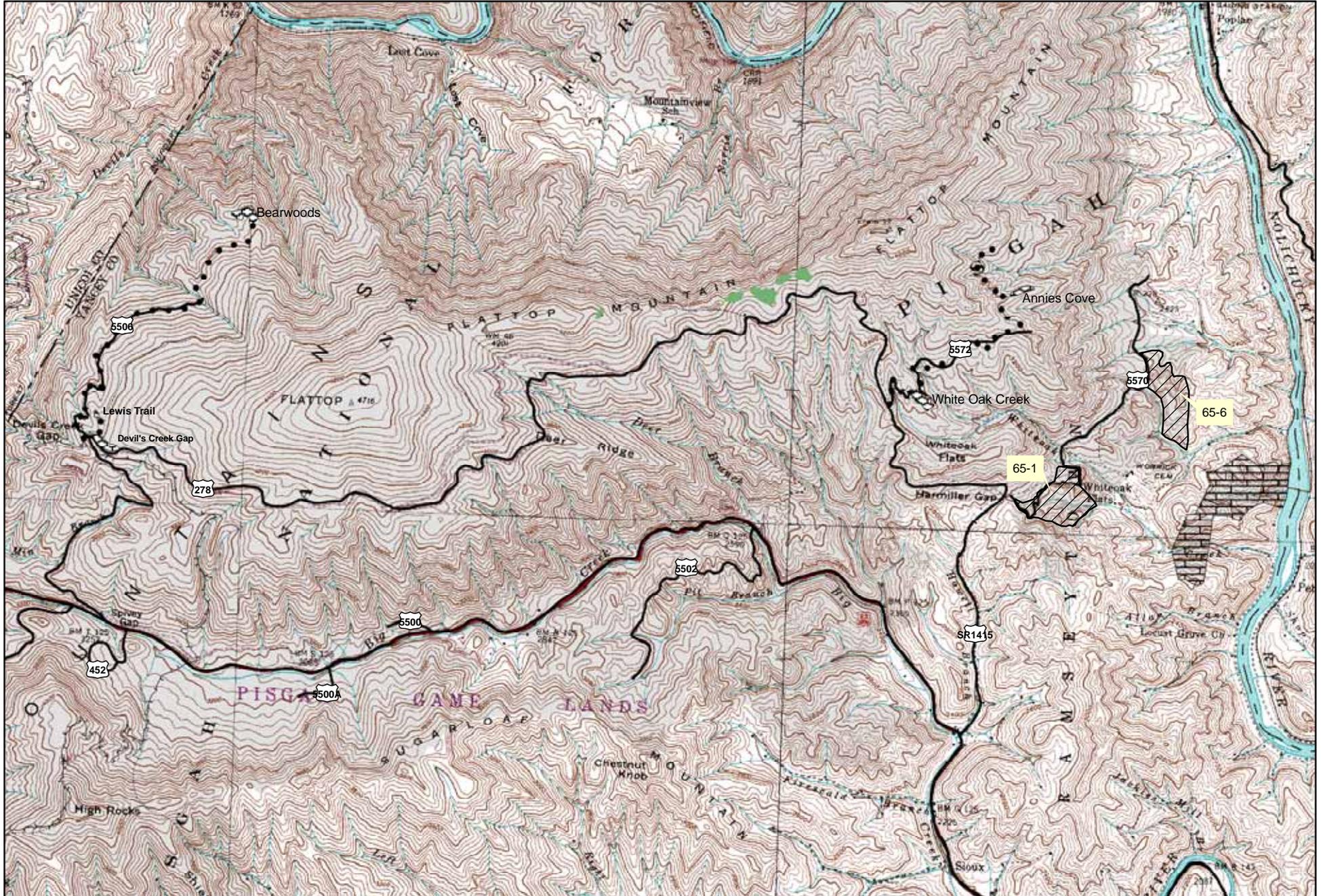
All roads, trails and wildlife linear and field openings are proposed for herbicide treatment of invasive exotic plants.

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Map prepared by LR 6/06

# Shinwhite Project Alternative C Map 4



- Proposed 2 Age Harvest
- Proposed New Wildlife Openings
- Proposed Daylighting Linear Wildlife Openings
- Small Patch Old Growth Proposal
- FS ownership
- Proposed Daylighting Wildlife openings
- Soil and Water Project
- Wildlife Openings
- Roads
- Appalachian Trail

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 N  
 Map prepared by LR 6/06

All roads, trails and wildlife linear and field openings are proposed for herbicide treatment of invasive exotic plants.