



United States
Department of
Agriculture

Forest
Service

White Mountain National Forest
Saco Ranger District

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File Code: 1950-1

Date: November 15, 2006

A Letter to Interested Parties of the White Mountains

Dear Stakeholder,

This letter is written to invite you to provide written comments on proposed actions described in the attached Than Forest Resource Management Project Environmental Assessment (EA) – Revised November, 2006.

If you are thinking you have seen this before, you are probably right. There was a previous comment period and Decision Notice for the Than project in early 2006. That Decision Notice was appealed on June 30, 2006. The appeal was reviewed by the Forest Supervisor who returned the document for additional analysis.

We have completed the additional analysis in the revised EA, and are now making it available for public review and comment. The EA discloses the proposed actions and effects analysis for forest and resource management activities on National Forest land in the Wildcat Brook drainage, and east of the Ellis River in the White Mountain National Forest, near the town of Jackson, NH. Proposed actions include timber harvest; improvements to roads; improvements to recreation; wildlife and aquatic habitat improvements; timber stand improvements; and streamside stabilization projects.

A Legal Notice of the 30-day comment period for this EA is being published in the *Conway Daily Sun* and the *Manchester Union Leader*. The EA is also posted on our White Mountain National Forest web page (www.fs.fed.us/r9/forests/white_mountain). The 30-day comment period begins on the day of publication in the newspaper of record, the *Manchester Union Leader*. Those members of the public who commented previously and those who appealed the original decision are being sent a copy of the EA with this cover letter.

New comments received during this 30-day comment period will be considered by the Responsible Official and need to be specific to the proposed action, have a direct relationship to the proposed action, and include supporting reasons for the Responsible Official to consider (36 CFR 215.2).



If you wish to submit comments regarding the proposed Than project, please follow the guidelines on the attached page. For more information, you may contact Rod Wilson (Ext. 120) or me (Ext. 102) at the address and phone number listed in the letterhead. Thank you for your interest.

Sincerely,

/S/ TERRY MILLER

TERRY MILLER
District Ranger

Attachment: Than Project EA

How to Comment on Than Project

In June 2003, the USDA-Forest Service issued new implementing regulations (Title 36, Code of Federal Regulations, Part 215) for notice, comment and appeals. The following instructions incorporate these changes. The new regulations allow only those who submit *timely* comments to be eligible to appeal a final decision. If you decide to submit comments, they should enhance the project analysis and provide meaningful and useful information about your concerns.

TO BE TIMELY your comments must be received within 30 calendar days following the publication of the legal notice in the Manchester Union Leader. When the comment period ends on a Saturday, Sunday or Federal holiday, comments will be accepted until the end of the next Federal working day. If you do not have access to the Union Leader, please call the Saco Ranger Station at 603-447-5448, ext. 120 (TTY 603-447-3121) for the published date.

It is the responsibility of persons providing comments to submit them by the close of the comment period. Individuals and organizations wishing to be eligible to appeal must provide the following information:

- 1) Name, address and telephone number;
- 2) Title of the proposed action (Than Project)
- 3) Specific substantive comments on the proposed action, along with supporting reasons the Deciding Official should consider in reaching a decision; and
- 4) Signature or other verification of identity upon request; identification of the individual or organization who authored the comments(s) is necessary for appeal eligibility;

Comments should be directed to Saco District Ranger Terry Miller as follows:

- Written comments must be postmarked by the Postal Service, e-mailed, FAXed or otherwise submitted by 11:59 pm ET on the 30th calendar day following publication of the legal notice.
 - Letters should be submitted to Terry Miller, District Ranger, 33 Kancamagus Highway, Conway, NH 03818. Hand delivered letters should be submitted during these office hours: Monday through Saturday, 8:00am-4:30pm;
 - FAX comments should be sent to 603-447-8405
 - E-mail comments should include an identifiable name and be sent to: (comments-eastern-white-mountain-saco@fs.fed.us). Comments submitted as electronic documents must be in plain text (.txt), rich text, format (.rft) or Word (.doc) format. When you submit your comments to this e-mail address, you should receive an electronic acknowledgement as confirmation of receipt. If you do not receive acknowledgement, it is your responsibility to ensure timely receipt by other means.
 - Oral comments may be submitted Monday through Friday 8:00am to 4:30pm, either by phone (603-447-5448 x120) or in person; and must be received by the close of business on the 30th calendar day following publication of the legal notice.

White Mountain National Forest



United States
Department of
Agriculture

Forest
Service

Eastern
Region



Than Forest Resource Management Project

Environmental Assessment

Town of Jackson
Carroll County, NH
Prepared by
Saco Ranger District
November 2006



For Information Contact:
Rod Wilson
Saco Ranger District
33 Kancamagus Highway
Conway, NH 03813
603 447-5448

**This document is available in large print.
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Than Forest Resource Management Project – Summary

The Saco Ranger District of the White Mountain National Forest is proposing the following management activities under the Proposed Action or Alternatives in the Than Project.

Forest Management

- Even-aged and uneven-aged timber management on up to 929 acres, producing approximately 6.0 million board feet of forest products.
- Placement of five temporary skidder bridges over perennial streams to keep equipment and logs out of brooks during skidding.
- Use of five existing landings and construction of two new landings.
- To insure regeneration objectives are met, possible implementation of pre-commercial release of existing regeneration on up to 100 acres in group selection and single tree selection units.

Transportation System

- Road maintenance and/or additional rock surfacing on up to 3.0 miles of existing roads.
- Road reconstruction on Forest Roads 512 (1.8 miles) and the end of Forest Road 233 (0.36 miles) to allow for three-season use of these roads for logging activities.
- Reconstruction of 1,500 feet of Forest Road 5555 to allow for three-season use, including permanent abutments for a temporary bridge over the Ellis River to access units 29-33.
- Reconstruction of a half-mile of existing road, construction of up to 500 feet of new road, and acquisition of Right-of-Way (ROW) across Jacksons' Prospect Farm to National Forest to access units 18-20.

Wildlife & Aquatic Habitat Improvements

- Placement of woody debris, using chainsaws and winches (i.e., trees felled to create pools), on the upper sections of Bog Brook, Wildcat Brook, Davis Brook, and Wildcat River to improve aquatic habitat.
- Removal of dilapidated structures near the origin of Bog Brook Trail.

Recreation Management

- Relocation of Bog Brook Trailhead onto National Forest land, or Jackson Town lands with an easement, including the possibility of a 750-foot connecting trail to Bog Brook Trail.
- Relocation of 500 feet of Wildcat River Trail above FSR 233 to eliminate erosion on the trail.
- Provision for a future Nordic trail from the end of Boggy Brook Trail (Wildcat Brook Road - NFSR 233) to East Pasture Trail, a trail length of about two miles (Alternatives 3 and 4).

Than Project is located in the Town of Jackson, Carroll County, New Hampshire, on the Saco Ranger District of the White Mountain National Forest. Ellis River, Wildcat River, and Wildcat, Bog, Davis, and Than Brooks are the primary drainages in the analysis area. Several small, unnamed tributaries are also included in the analysis area. The Wildcat River HMU (12,079 acres) and the east portion of the Ellis River HMU (2,120 acres) comprise the analysis area.

The following list describes the “need for change” and opportunities identified for the Than Analysis Area in order to implement the White Mountain National Forest Land and Resource Management Plan.

1. There is a need to create up to 340 acres of early successional habitat.
2. There is a need to reduce stocking in mature and overmature hardwood stands, improving species composition and the quality and health of these hardwood stands, while providing forest products.
3. There is a need to increase the softwood component and reduce overall stocking in mixedwood stands.
4. There is a need to provide public parking for Bog Brook Trail and to provide additional hiking or Nordic access to existing trails.
5. There is a need to implement stream and trail rehabilitation projects.

The Proposed Action or Alternatives may result in the following effects.

- Season-long Nordic use restriction on Forest Road 233 (Boggy Brook Trail) and a section of Carter Notch road, and, under Alternatives 2, 4, and 5, on Forest Road 512 (Quail Trail).
- Possible occurrence of short-term, localized sedimentation at temporary stream crossings and in conjunction with proposed road and bridge construction sites.
- Visibility of temporary openings (clearcuts) from identified viewpoints.
- A reduction of up to 218 acres of mature hardwood forest, resulting in creation of early successional habitat and associated benefits to wildlife dependent on this habitat.
- Release of existing softwood regeneration in group selection and single tree selection units.
- Minor, localized, and short-term effects to water quality and water quantity from harvest activities, from road reconstruction and maintenance, and from watershed rehabilitation projects on Bog Brook, Wildcat Brook, Davis Brook, and Wildcat River.
- Improved road surfaces and drainage features on roads allowing for summer and fall access.
- Permanent bridge abutments at the Ellis River crossing to units 29-33.
- Temporary displacement of wildlife during implementation.
- Creation of diverse forested habitats, as well as fishery and aquatic improvement in local brooks.

Than Forest Resource Management Project – Environmental Assessment

- Removal of up to 6.0 million board feet of timber.
- Provision of jobs in harvesting and manufacturing.
- Improved health and growth of residual trees in thinned stands.
- Hiking trail and trailhead improvements, and construction of an additional connecting Nordic trail.

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Chapter 1 – Purpose and Need for Action

Introduction and Document Structure

On June 30, 2006, the Than Project Decision was appealed. Following a thorough review by the Forest Service, the decision was reversed on August 16 by the Appeal Deciding Officer. The additional effects disclosure needed has been added to this revised Environmental Assessment (EA), which will be available for a 30-day public comment period starting the day after publication of a Legal Notice in the Manchester Union Leader. The EA will be sent to those who have commented or otherwise been involved in the project.

The Forest Service presents this (second) version of the Than Environmental Assessment in compliance with the National Environmental Policy Act (NEPA) and other relevant federal laws and regulations. The EA discloses the Proposed Action and connected actions, issues, alternatives, and analysis of the direct, indirect, and cumulative environmental impacts that would result under each of the alternatives. The document is organized into four chapters, plus Appendices A-E.

- **Chapter 1– Purpose and Need for Action:** This section includes information on the history of the project proposal, the purpose and need for the project, and the agency’s proposal for achieving that purpose and need. This section also details other information related to this project.
- **Chapter 2 – Alternatives, Including the Proposed Action:** This section provides a more detailed description of the agency’s Proposed Action and alternatives for achieving the stated purpose and need. These alternatives were developed based on public and agency issues. The chapter also includes connected actions under all action alternatives, alternatives considered and eliminated from further study, and a comparison of alternatives summary table. The summary table displays the environmental effects (management indicators) of implementing the action alternatives.
- **Chapter 3 – Affected Environment and Environmental Consequences.** This section describes the environmental effects of implementing the Proposed Action and the alternatives. Each resource is described (affected environment), followed by the effects of the No Action alternative, which provides a baseline for evaluation and comparison of the action alternatives that follow.
- **Chapter 4 – Agencies and Persons Consulted:** This section provides a list of agencies and persons consulted during the development of the environmental assessment.
- **Appendices:** Appendices A-E provide detailed information to support the analysis in the EA.

Additional documentation and literature regarding the development of this action and its effects on the physical and biological resources may be

found in the project planning record, located at the Saco Ranger District Office, Conway, New Hampshire.

A new Decision Notice and Finding of No Significant Impact will be sent to all those who responded during the first comment period, as well as to those commenting during this (second) public comment period. These documents will also be available on the White Mountain National Forest Web site <www.fs.fed.us/r9/forests/white_mountain>.

Reference Appendix B for more information on “Where this Project is in the Forest Service NEPA Process.”

Tiering to the 2005 Final Environmental Impact Statement for the White Mountain National Forest Land and Resource Management Plan

The analysis for this project is tiered to the Final Environmental Impact Statement (FEIS) and Record of Decision (ROD) for the 2005 White Mountain National Forest Land and Resource Management Plan (USDA-Forest Service, 2005b, FEIS).

Tiering is described in Forest Service Handbook (FSH) 1909.15 as a process of summarizing and incorporating by reference from other environmental documents of broader scope to eliminate repetitive discussions of the same issues and to focus on the actual issues ripe for decision (USDA-Forest Service, 1992, FSH 1909.15, Chapter 42.1). The Handbook specifically notes that the EIS for a land and resource management plan is an example of a “broad” EIS prepared for a program or policy statement (USDA-Forest Service, 1992, FSH 1909.15, Chapter 22.31).

The Land and Resource Management Plan (also called the Forest Plan) is the “principal tool for preserving, protecting and managing the resources that comprise the White Mountain National Forest, while at the same time making those resources available to the public for a variety of uses.” (USDA-Forest Service, 2005b, FEIS) The Forest Plan is a programmatic document that implements the Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA), as amended by the National Forest Management Act of 1976 (NFMA). The Forest Plan implements NFMA by providing “for diversity of plant and animal communities based on the suitability and capability of the [White Mountain National Forest] in order to meet overall multiple-use objectives and within the multiple-use objectives of a land management plan.” (16 USC 1604(g)(3)(B))

The Forest Plan sets management direction for the White Mountain National Forest through the establishment of short-term (10-15 years) and long-range goals and objectives. It prescribes the standards, practices, and the approximate timing and vicinity of potential actions that are necessary to achieve these goals and objectives. The Forest Plan prescribes monitoring and evaluation needs to ensure that direction is carried out, measures quality and quantity of actual operations against predicted outputs and effects, and forms the basis for implementing revisions.

Of the 796,700 acres comprising the White Mountain National Forest, approximately 358,000 acres are allocated to General Forest Management

(Management Area 2.1) in the 2005 LRMP. However, only a portion of the MA 2.1 lands are actually available for management through timber harvest, as approximately 281,000 acres Forest-wide are considered “suitable lands” where vegetative management is permitted through the use of commercial timber harvesting. Lands in MA 2.1 that are not “suitable” for timber harvest may include wetlands, reserve areas, riparian management zones, steep terrain, or areas that are otherwise inaccessible. These lands represent a variety of habitat types and will generally grow into old forest habitat. Suitable lands are typically in lower elevations (below 2,500 feet) where timber management is used to maintain a variety of wildlife habitat conditions and generate timber products. The acres proposed for timber harvest in the Than Vegetation Management Project are part of this “suitable” land base.

In addition to allocating lands, the Forest Plan provides a strategy to manage well-distributed and suitable wildlife habitat for maintaining “viable populations of existing native and desired non-native vertebrate species.” (36 CFR 219.6) The Forest Plan has established blocks of National Forest land called *Habitat Management Units* (HMUs) in which “habitat composition and age class objectives [are] established to help ensure that habitats are well-distributed across the forest and provide a framework for analyzing project impacts to wildlife habitat at a local scale. Blocks vary in size from about 6,000-49,000 acres, and contain a variety of habitat types and land in a mix of Management Areas.” (USDA-Forest Service, 2005a, LRMP) HMU boundaries are based on Ecological Land Types, Land Type Associations, watersheds, topography, and other landscape or geographical features.

Habitat management objectives are developed for each HMU. These objectives are “based on land capability, current condition, and landscape needs to meet management area objectives.” (USDA-Forest Service, 2005a, LRMP, pp 2-33) These habitat management objectives are developed for an individual HMU prior to implementation of vegetative management in that HMU.

The Desired Future Condition (DFC) of an HMU is based on the capability of the land specific to the HMU, and is intended to contribute to a diversity of habitats across the National Forest, including various forest types, age classes and non-forested habitats (USDA-Forest Service, 2005a, LRMP, pp 1-20). Capability is determined by the Ecological Land Types within the HMU landbase. An Ecological Land Type (ELT) can include an area of a few hundred to a few thousand acres with a well-known succession of forest species on unique soil materials; and ELT classification is based on geomorphic history, nature of soil substrata, and potential natural vegetation. Maintaining a diversity of habitats is essential to meeting the life cycle needs for wildlife species inhabiting the National Forest (DeGraaf et al. 1992, DeGraaf and Yamasaki 2001). Examples of habitat types include “northern hardwood,” “spruce-fir,” and “aspen-paper birch.” Age classes are based on stages of natural forest succession, ranging from “regeneration” (0-9 years) to “old” (beyond the age when growth begins to decline, typically the traditional rotation age for each forest type). Wildlife

species that require or otherwise use “early-successional” openings would benefit from the availability of forest openings in the regeneration phase of growth, as well as any maintained permanent wildlife openings. The same correlation is true of mature and old stands for those species that require or otherwise use “late-successional” vegetation. Early-successional vegetation is characterized most often by dense, ground level plant cover in areas open to direct sunlight. Late-successional vegetation is more typically characterized by large, mature woody vegetation with a closed canopy (foliage) that blocks sunlight from reaching the ground.

Scope of the Decision

The Proposed Action and alternatives for the Than project, as well as the analysis of their effects described in this assessment, are confined in scope to the area of the White Mountain National Forest within which they are contained, and as addressed in the 2005 Land and Resource Management Plan. Neither this environmental assessment, nor the eventual Decision Notice and Finding of No Significant Impact, are intended or expected to apply to any area outside the White Mountain National Forest, regionally or nationally.

Background

The **analysis area** for the Than Project includes the Wildcat River Habitat Management Unit (HMU), approximately 12,079 acres in size, and the east half of the Ellis River HMU, approximately 2,120 acres in size. Vegetation management activities are prescribed in MA 2.1 lands within these HMUs to achieve the goals and objectives of the White Mountain National Forest Land and Resource Management Plan (LRMP, 2005).

The **Project Area** contains approximately 929 acres of stand treatments on National Forest land within Wildcat River HMU and the east portion of the Ellis River HMU. The Project Area is that portion of the analysis area where proposed vegetative management and connected actions (activities involving roads, landings, watershed improvements, and trails) will occur. Wildlife habitat improvement treatments and riparian area improvement projects, as well as the proposed recreation improvement projects, all lie within Jackson Township, in Carroll County, New Hampshire.

Ellis River, Wildcat River, and Wildcat, Bog, Davis, and Than Brooks are the primary drainages in the analysis area. Several small, unnamed tributaries are also included in the analysis area. Condition surveys for these brooks have shown that, while streams are relatively stable and riparian areas are generally functioning well, there is a lack of large woody material in the streams.

Prior timber management activities on National Forest land and logging on nearby private land in the area led to the construction of the existing road systems within and surrounding the Project Area. Evidence of logging since the 1940s, including truck roads and skid roads, thinned stands, and young pole stands, can be observed in much of the analysis area.

The Marsh Brook sale, planned in the early 1990s and implemented from 1991 to 1996, constructed a total of 1.3 miles of improved winter road

through Town of Jackson property (NFSR 512) to improve access to the area for forestry activities. Two million board feet of timber was harvested from a 51-acre group selection and seven clearcuts totaling 123 acres. NFSR 512 connected Forest Road 233 (Carter Notch Road) with existing roads used for harvest since the 1950s in the vicinity of Marsh Brook and Spruce Mountain.

Under the Forest Plan that pre-dates 1986, in the years from 1984 to 1987, Wildcat Timber Sale reconstructed NFSR 233 and clearcut 113 acres. During the same period (1982-1986), several stands totaling approximately 800 acres were thinned and six stands totaling 206 acres were clearcut, primarily in the Wildcat Brook drainage.

In the east portion of the Ellis River HMU, across from the Rocky Branch Trailhead, three clearcut units totaling 85 acres were logged from 1974 to 1978. The Ellis River Crossing road, a temporary truck bridge across the Ellis River, and a landing were constructed to access the area east of the Ellis River. That access is the same as proposed for this project. An additional sale (Ellis River Sale) slated to use the Ellis River Crossing was sold in the early 1990s.

Since these sales, Nordic skiers and hikers have enjoyed the use of these haul roads, both on private land and on the National Forest. Wildcat Brook Road (NFSR 233) is groomed early in the season for Nordic skiing (Boggy Brook Trail) and is under permit to Jackson Ski Touring Foundation, a non-profit organization based in Jackson, New Hampshire. In addition, Nordic skiing is available on “Prospect Farm” and National Forest land accessed through the farm, including the Wildcat Valley, Dana Place, U.S.T, Halls Ledge Overlook, Orchard, Quail, Beth Hendrick, and Hubs Loop trails. Black Mountain Ski Trail, south of the project area, is used for hiking and skiing. Light summer and fall use of these roads occurs by individuals who enjoy walking there, or mountain biking *where allowed*.

Hiking near the Project Area includes Halls Ledge Trail (#516), Wildcat River Trail (#213), Wild River Trail (#165), Bog Brook Trail (#214), Hutmans Trail, and Black Mountain Trail (#218).

There is evidence of a rock retaining wall along the upper Wildcat River, above NFSR 233, that may have been associated with a mill site. There are cellar foundations on private land in the vicinity of Black Mountain Trail, along the Wildcat Valley Trail on the Town of Jackson’s Prospect Farm, and near the end of NFSR 233 in unit 1. Apple trees are present at the two locations on private land.

The Town of Jackson owns a 500 acre parcel of land within the analysis area, commonly referred to as “Prospect Farm.” This area was likely used for sheep grazing. All of the acres are now abandoned farmland returning to a wooded condition, aged about forty years, and for which Jackson is preparing a Forest Management Plan to thin certain stands within the next five years or so.

A roads analysis was conducted for this analysis area in conjunction with the Popple Project (Roads Analysis, 2005), and was modified to include the area across Ellis River referred to above. The roads analysis is used to

identify long-term needs for transportation access. The primary access to the analysis area is National Forest System Roads (NFSR) 233, 512, and reconstructed access across Ellis River to an existing landing for units 29 – 33. NFSR 233 and 512 are gated, but remain open to non-motorized traffic.

Description of the Than Analysis Area

The project is located in the Town of Jackson, Carroll County, New Hampshire. The analysis area for water incorporates the tributaries that comprise Wildcat River and Ellis River. The analysis area for wildlife is the Ellis River HMU and the Wildcat HMU. These areas lie east of the Presidential Range - Dry River Wilderness. Analysis area boundaries for other resources are described under each resource in the Environmental Assessment and are commensurate with the area of influence for each resource. See the maps (Figures 1 and 2) for additional information on the project area.

Purpose of the Action

The purpose for this project is to accomplish resource objectives to meet the overall management direction for the White Mountain National Forest, as established in the Forest Plan (Revised in 2005).

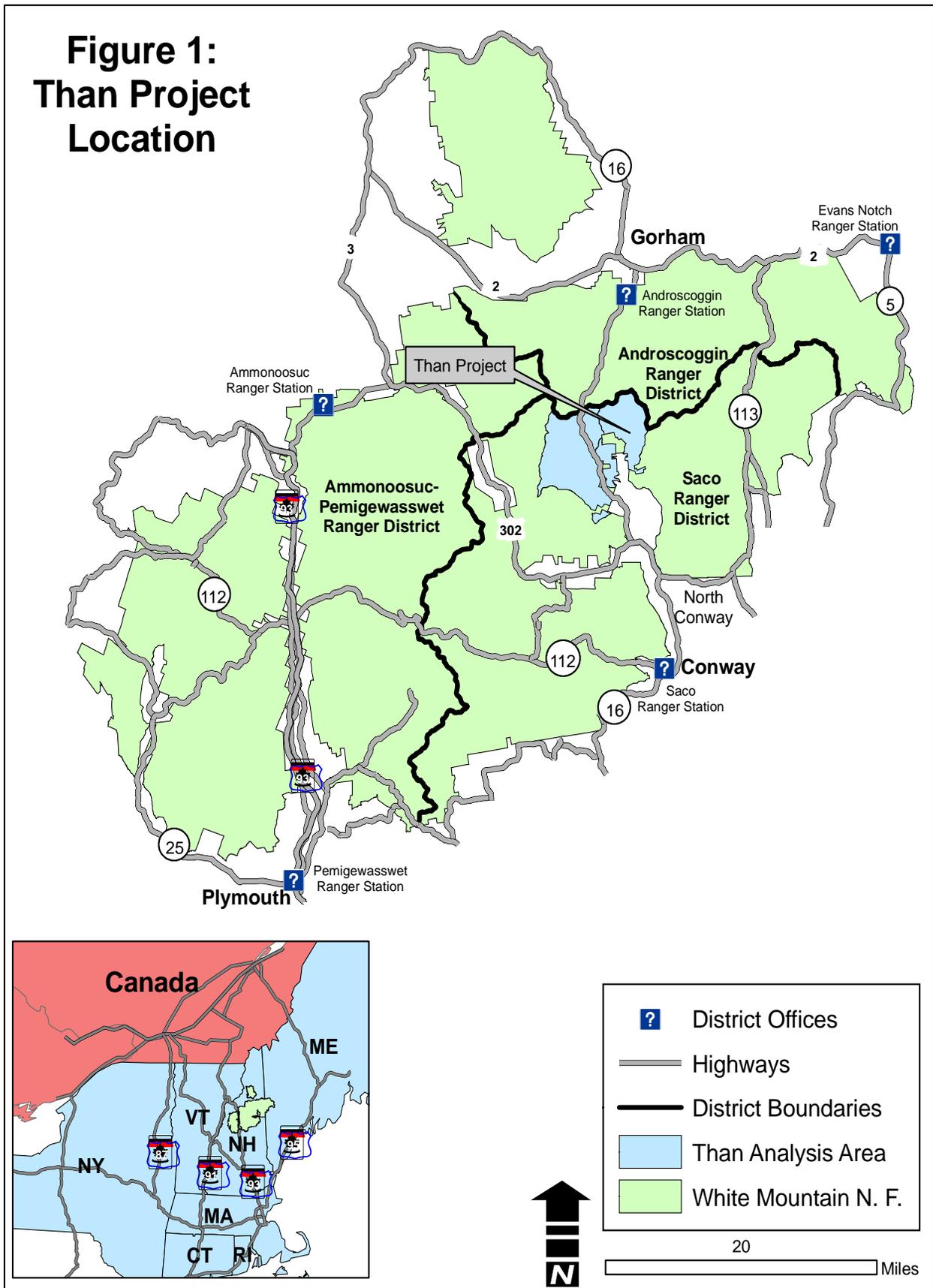
Management of vegetation within the Project Area is intended to meet Forest-wide goals and objectives for habitat, including (USDA-Forest Service, 2005a, LRMP, p 1-20):

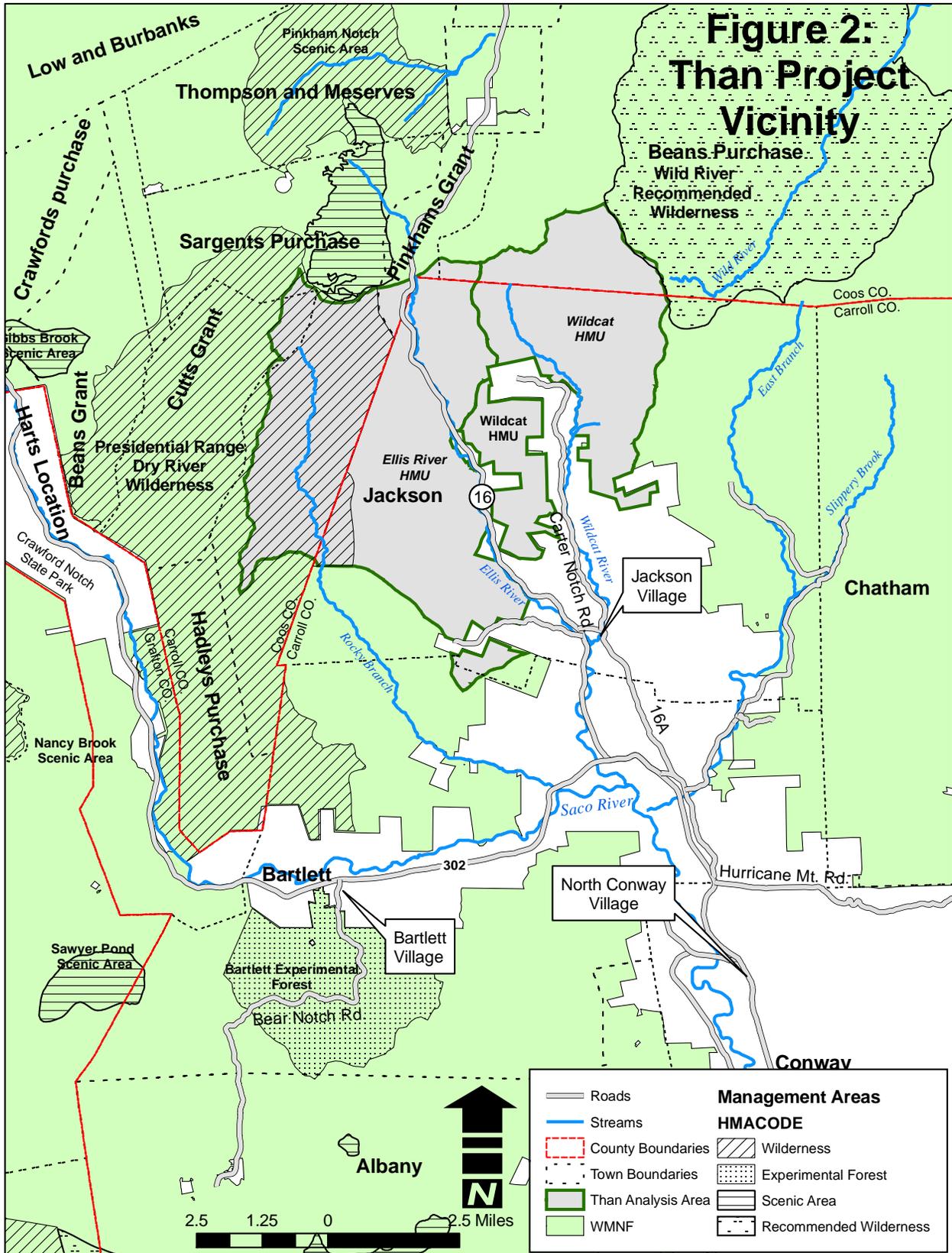
1. Manage forest composition for the broad habitat types of northern hardwood, mixed hardwood-softwood, and spruce-fir forest, consistent with Ecological Land Type capability.
2. Maintain less common habitat types, such as aspen-birch and oak-pine, where ecologically feasible and desirable to provide for native and desired non-native wildlife and plant species.
3. Maintain high quality mature forest and old forest habitats on a majority of the Forest.
4. Provide regeneration-age forest and open habitats to sustain biological diversity and support species that prefer those habitats.

The Project Area is within land designated as Management Area (MA) 2.1, General Forest Management. The Forest Plan lists the Purpose for MA 2.1 as four-fold (USDA-Forest Service, 2005a, LRMP, p 3-3):

1. Provide high quality hardwood sawtimber and other timber products on a sustained yield basis.
2. Provide a balanced mix of habitats for all wildlife species.
3. Provide opportunities for a full mix of recreational opportunities from low-use hiking trails to highly developed campgrounds, and meet ROS objectives varying from urban to semi-primitive motorized, in different locations and varying by season or presence of management activities. (Note: Portions of this project area are managed as Nordic ski trails under a special use permit issued to Jackson Ski Touring Foundation. The Alternatives vary in the degree that they minimize impacts or enhance recreation opportunities).

**Figure 1:
Than Project
Location**





4. Manage high-use or highly developed recreation areas to acceptable social and ecological standards; manage to retain some low-use and less developed areas.

Need for the Action

The Forest Plan describes the Desired Future Condition (DFC) for lands allocated to MA 2.1 as “a mix of deciduous and coniferous forest stands of various types. The stands vary in size, shape, height, and tree species. Both even-aged and uneven-aged harvest techniques will be used.” To achieve this condition, “silvicultural practices will be used to meet timber, ecological, visual, and recreation objectives. Most stands will provide high quality sawtimber. Suitable habitat will be provided for a variety of wildlife and plant species.” Further, “habitat at the landscape level will include a sustainable mix of young and mature forest. Permanent and temporary openings will occur across the landscape in shapes and sizes that are consistent with scenic objectives in an area. All communities that would naturally be present will be managed so that they are maintained or enhanced.” (USDA-Forest Service, 2005a, LRMP, p 3-3).

The Forest Plan establishes the Habitat Management Unit (HMU) as the base level for identifying existing conditions and land capability, and developing habitat composition and age class objectives that contribute to the DFC. A Need for Action is determined when there is a difference between the existing condition and the desired condition of an HMU. Based on this difference, stands within compartments are identified for silvicultural treatment to achieve the habitat and age class objectives that describe the DFC. An Interdisciplinary Team (IDT) of Forest Service resource specialists chose stands for silvicultural treatment by comparing existing habitat conditions to desired conditions as outlined in the Forest Plan and as determined by developing HMU-specific habitat management objectives. This analysis indicated there is a *need* for a more diverse age class and habitat composition (Forest Plan, VII-B-12/13), and for improved stand conditions to insure optimum tree growth and quality of wood products.

The IDT considered many factors when monitoring forest conditions. Forest vegetative conditions change over time as trees mature, and thereby present opportunities in some areas to enhance overall conditions within an HMU. The interdisciplinary team evaluated current conditions in these HMUs during numerous on-site visits. Field observations included evidence of well-stocked softwood, mixedwood, and hardwood stands, with average amounts of disease and mortality, where stand treatment would enhance forest diversity. Inventory plot data was collected, including tree ages, species composition, tree condition, crown closure, stand density, understory vegetation data, and other components. Inventory data is used to help determine silvicultural prescriptions and to predict stand development following harvest. Other observations and analysis include effects of past management and ongoing recreation uses; evidence of wildlife; surveys for sensitive plants and animals and for invasive species; surveys for Heritage Resources; condition of roads, trails, and streams; soil types and land stability; and scenery evaluation.

The Forest Plan has established Forest-wide composition and age class objectives, by habitat type, for Management Area 2.1 lands (USDA-Forest Service, 2005a, LRMP, pp 1-20 to 1-22), to:

1. Manage forest composition for the broad habitat types of northern hardwood, mixed hardwood-softwood, and spruce-fir forest, consistent with ecological land type capability.
2. Maintain less common habitat types, such as aspen-birch and oak-pine, where ecologically feasible and desirable to provide for native and desired non-native wildlife and plant species.
3. Maintain high quality mature forest and old forest habitats on a majority of the Forest.
4. Provide regeneration-age forest and open habitats to sustain biological diversity and support species that prefer those habitats.

In accordance with Forest Plan direction, habitat management objectives for the Wildcat and Ellis River HMUs were developed based on land capability, current condition of the HMU, and landscape needs (USDA-Forest Service, 2005a, LRMP, p 2-33, S-1). By comparing these objectives (Desired Future Condition) with the existing composition and age class distribution, the ID Team determined the Need for Change within MA 2.1 lands for these HMUs. Tables 1a and 1b provide a summary of existing and desired condition by community type, and the need for change.

The tables show that to meet the habitat and stand structure objectives of the Forest Plan within the analysis area, there is a need to establish regenerating stands. Within the analysis area there is limited potential, due to soil type, to create aspen and paper birch stands. Even-aged harvest methods can be used to convert some of the mature and overmature northern hardwood stands to a regenerating age class (0-9 years). The tables

Table 1a. Acres by Community Type in MA 2.1 within the analysis area Wildcat River HMU.

Community Type	Existing	Desired Future Condition	Need
Early-successional northern hardwoods	19	239	220
Spruce/Fir	712	2096	1384

Table 1b. Acres by Community Type in MA 2.1 within the analysis area Ellis River HMU (part).

Community Type	Existing	Desired Future Condition	Need
Early-successional northern hardwoods	130	250	120
Spruce/Fir	177	1700	1523

also show the need to release understory and co-dominant spruce, fir, and hemlock trees from competing hardwoods in mixedwood stands. Uneven-aged harvest (group selection and single tree selection) is used to remove hardwood overstory trees from a spruce-fir understory and thereby increase their softwood component.

There is a need to maintain recreation opportunities in the analysis area, including improved parking for the moderately used Bog Brook and Wildcat River Trail and a connecting trail to Bog Brook Trail. Also needed is an alternate access route to Black Mountain Cabin and East Pasture Trail that does not require access through private land. An access route is possible from the end of Forest Road 233 (Boggy Brook Trail). These improvements would enhance the recreation experience. In addition, a section of Wildcat Brook Trail periodically washes out, suggesting a need for 500 feet of trail re-location.

There is a need to restore large woody material to improve fisheries and aquatic habitat in Bog, Davis and Wildcat Brooks. Turn of the century harvest activities led to a reduction of dead trees that would have naturally added to stream debris. Pool habitat and decaying wood that aquatic organisms rely on are lacking in these streams. The proposal would increase the amount of wood to an average of approximately 300 pieces per mile in the headwaters of Wildcat River, Wildcat Brook, Bog Brook, and Davis Brook. Projects previously implemented on the WMNF (Great Brook and Evans Brook in Maine) have shown this to be compatible with surrounding riparian requirements (Prout, personal communication 2006). Streams proposed for work are stable, with minimal bank erosion and little bed-load movement, indicating they are highly suitable for habitat improvement by adding woody debris to form pools and cover, or to protect banks.

These HMUs have been accessed in the past, often with low standard or “winter” roads. To accomplish long term Forest Plan management objectives and to prevent or reduce potential long term erosion, some existing roads need improvement and maintenance.

Proposed Action

The Saco Ranger District of the White Mountain National Forest proposes to manage forest vegetation to increase wildlife habitat diversity, forest stand health and vigor, and to improve recreation opportunity within the Than Analysis Area.

The Proposed Action is designed to fulfill the Purpose and Need for Action as described above, and to achieve the desired vegetative conditions described in the Forest Plan. These goals include creating regeneration-age habitat, facilitating softwood development, and providing forest products on a sustained yield basis. Connected actions, such as Bog Brook Trailhead relocation, creating wildlife openings, and pre-commercial release projects, are needed to enhance resources conditions within the analysis area.

National Forest System Roads (NFSRs) to be used include 233, 512, and 5555. These roads are currently closed to public motorized traffic and would

remain closed during and following implementation of an action alternative, if selected.

The following Proposed Action is designed to respond to the Purpose and Need for action by (1) providing high quality sawtimber and other forest products to benefit the local economy; (2) promoting the desired vegetation and habitat conditions outlined in the Forest Plan; (3) providing for, and managing, recreation opportunities; and (4) managing the transportation system in this area to meet long term needs for access and resource protection.

Forest and Habitat Management

- Improve timber quality and species composition in hardwood stands through approximately 318 acres of commercial thinning and 66 acres of single-tree selection treatments.
- Increase early successional habitat by creating approximately 181 acres of hardwood regeneration habitat through clearcutting and shelterwood.
- Enhance softwood composition and improve wildlife habitat through approximately 364 acres of group and single-tree selection harvests.
- Use five existing landings, and construct two new landings.
- Place five temporary skidder bridges over perennial streams to keep equipment and logs out of brooks.

Transportation System

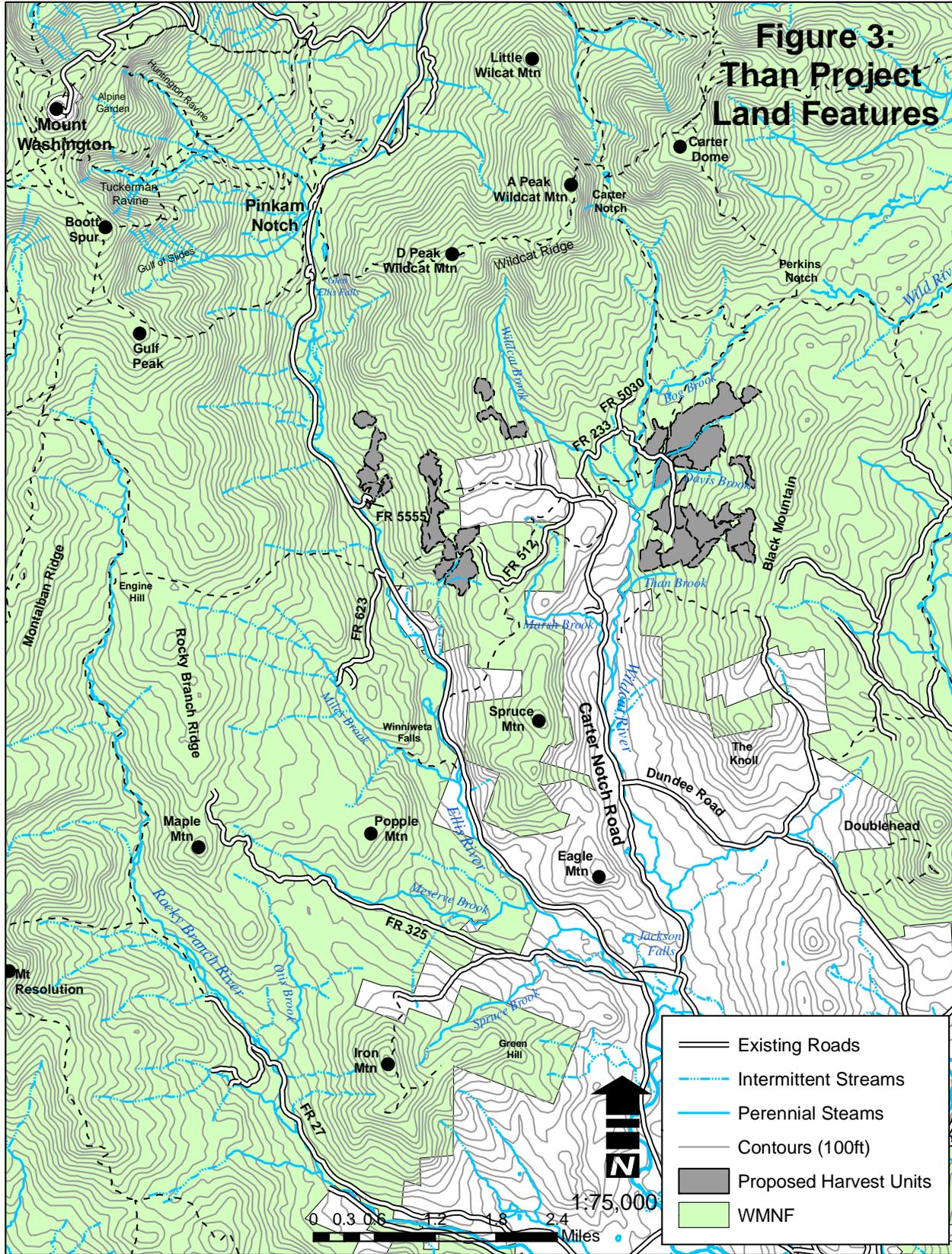
- Perform road maintenance and/or rock surfacing on approximately 3.0 miles of existing roads.
- Reconstruct Forest Roads 512 (1.8 miles), and the end of Forest Road 233 (0.36 miles) to allow for summer and fall harvest activities.
- Reconstruct 1,500 feet of Forest Road 5555 (Ellis River Crossing) to allow for three-season use, including permanent abutments for a temporary bridge crossing of the Ellis River to access units 29-33.
- Reconstruct 2,000 feet of low standard road with Right-of-Way across Jackson's Prospect Farm and construct 500 feet of low standard new road to access National Forest for a landing for Units 18-20.
- Remove all temporary drainage structures and temporary bridges, treat needed areas for erosion (seeding and waterbars), and return previously closed roads to a closed intermittent status at the conclusion of this project.

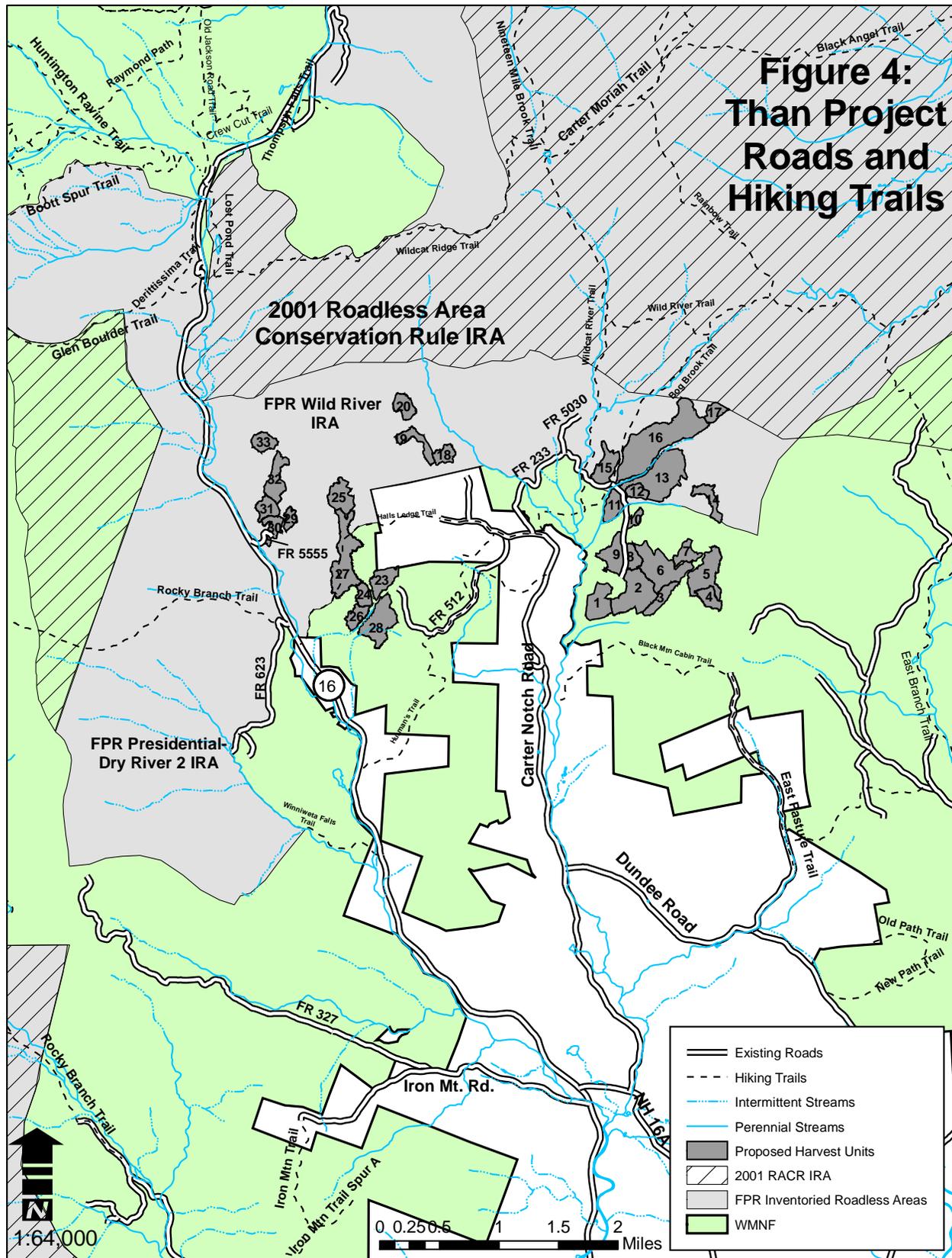
Wildlife and Aquatic Habitat Improvement

- Place woody debris to create pools and cover, and stabilize streambanks using hand tools on up to 6 miles of Bog Brook, Wildcat Brook, Davis Brook, and Wildcat River.

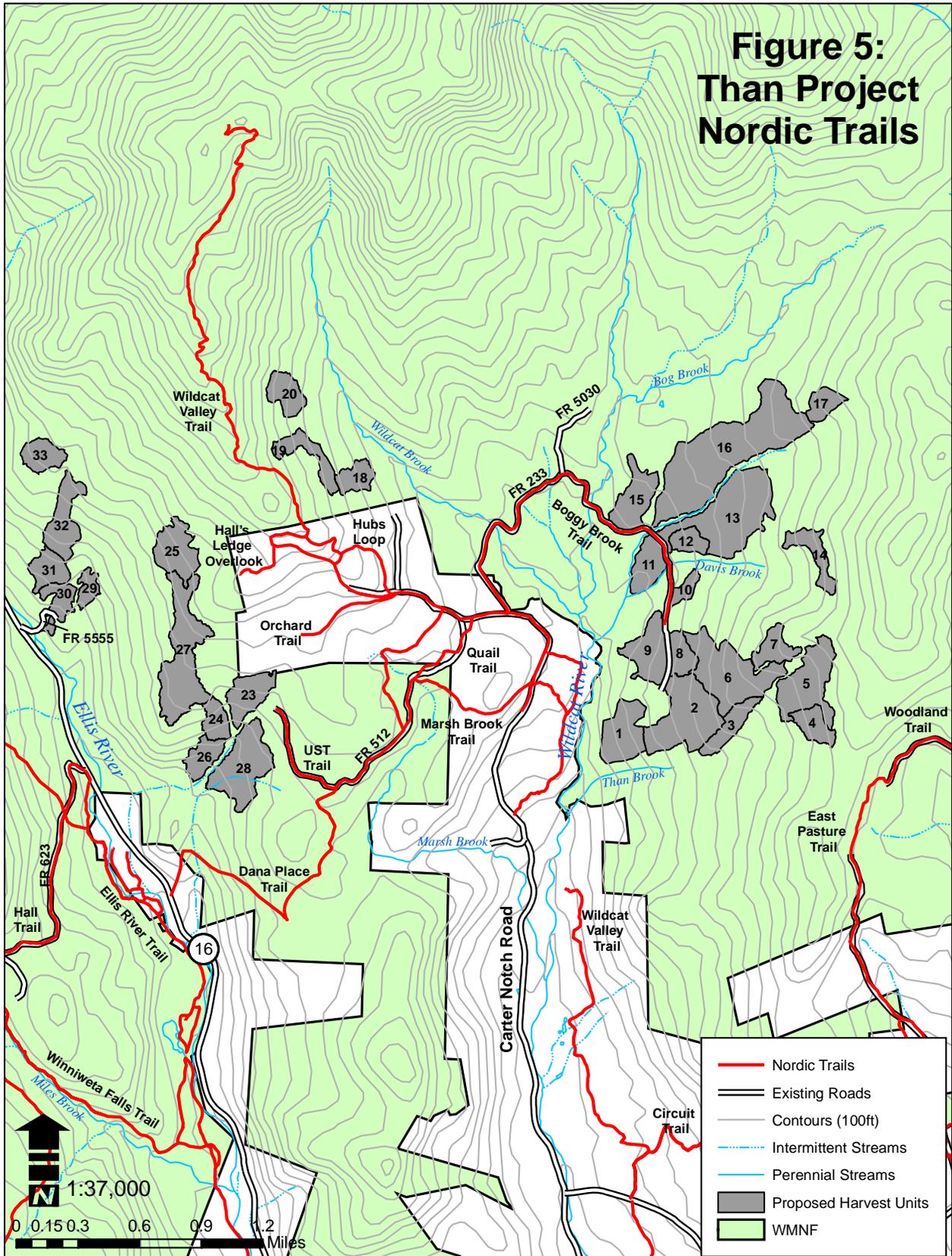
Recreation Management

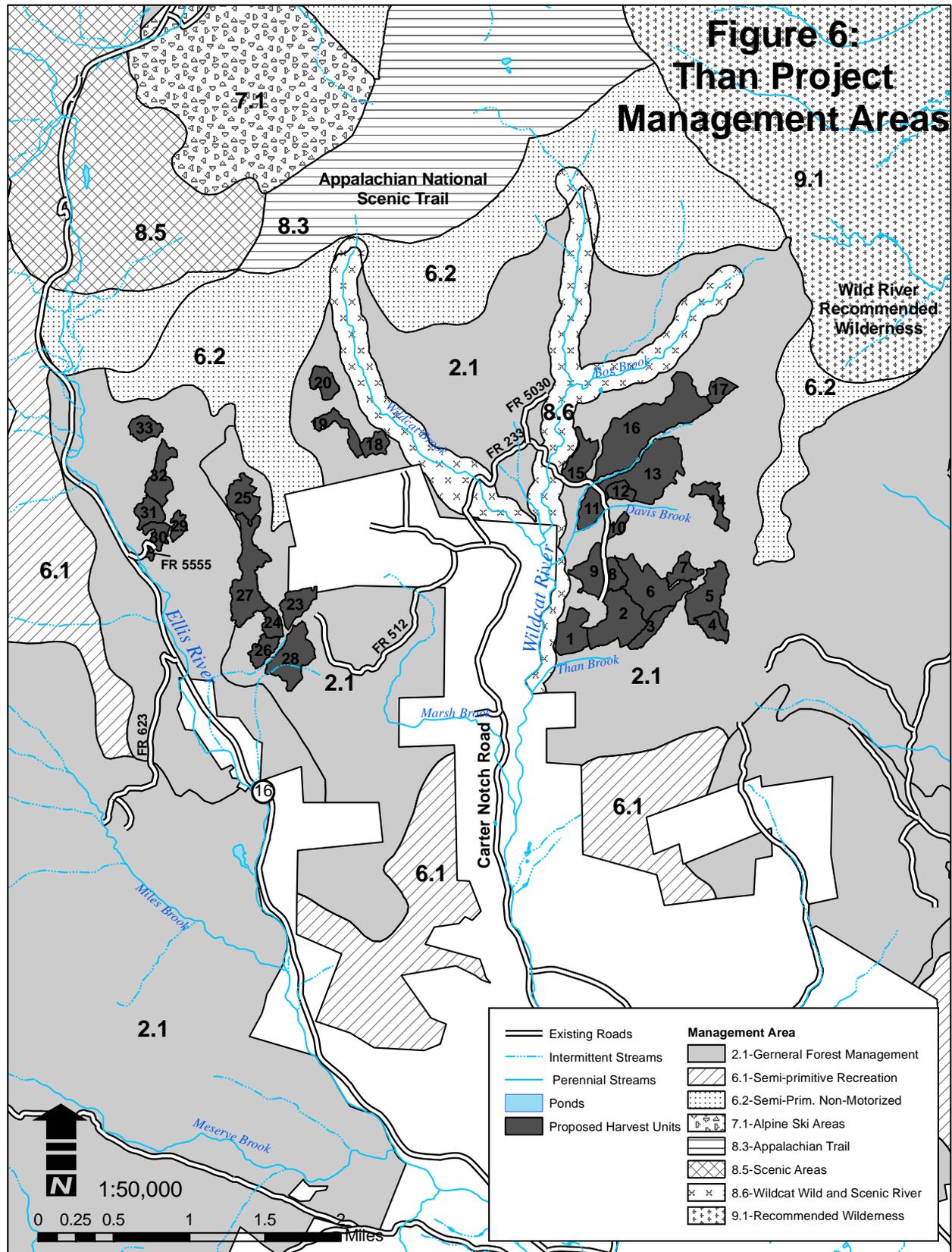
- Relocate 500 feet of Wildcat River Trail above FSR 233 to eliminate erosion on the trail.





**Figure 5:
Than Project
Nordic Trails**





Connected Actions

- To insure regeneration objectives are met, pre-commercial release of regeneration on up to 100 acres in group selection and single tree selection units may be implemented if needed.
- Move Bog Brook Trailhead onto National Forest or Town of Jackson lands with an easement or agreement, including approximately 750 feet of connecting trail to Bog Brook Trail.
- Remove delapidated structures near the current trailhead for Bog Brook Trail.
- In accordance with the Project Roads Analysis, the following roads currently impassable to vehicles are not needed and will be removed from the roads database: NFSR 5020, 5021, 5022, 5024, 5026, 5028, 95440, and 95441. These are non-maintained, secondary roads or former temporary roads no longer needed. They may be used as skid trails in the future. Two currently serve as portions of hiking (5026 – Hutmans) or Nordic (5024 – Dana Place) trails. Where these roads serve as hiking trails, their current condition will remain unaffected by this action.
- Whole tree removal would be allowed (but not required) in the following units: 1-3, 5-10, 12, 18-20, 23-25, 33, 34, and 38.

Decision Framework

Considering the Purpose and Need for Action, the deciding official, Saco District Ranger Terry Miller, reviews the proposed action, the public comments, the issues and alternatives, the proposed mitigations, and the environmental effects in order to make decisions based on the following questions.

- Is the range of alternatives adequate to address relevant issues raised by the public and the interdisciplinary team and to meet the Purpose and Need for Action?
- Which of the alternatives best addresses relevant issues and the purpose and need for this project?
- Would the decision to implement an alternative pose any significant environmental impact that would require an environmental impact statement?
- Does the decision to implement an alternative meet applicable federal, state, and local laws and policies, including consistency with the Forest Plan?
- Do the proposed mitigation measures meet Forest Plan Standards and Guidelines?

Public Involvement

On January 24, 2006, a 45 page document titled “Than Forest Resource Management Project – Public Comment Package” was mailed to over 180 organizations, interested parties, and abutters for a 30-day comment period which ended on February 24, 2006. An announcement of the Public Comment Period was published in the *Mountain Ear* and in the legal notices section of the *Manchester Union Leader* on January 24, 2006. This project is listed in the Quarterly Schedule of Proposed Actions for the White Mountain National Forest. The Public Comment Package and other completed documents are available on the White Mountain National Forest web site <www.fs.fed.us/r9/forests/white_mountain>.

The district also held an informational public meeting in conjunction with a Jackson town meeting on February 13, 2006. Close to a hundred people were present. Follow-up conversations were held with the town and with Jackson Ski Touring Foundation.

A total of 27 commenters mailed letters. Many of the public comments received for this project are incorporated into the project’s design and development of alternatives.

A Decision Notice was signed on May 16, 2006 and was appealed on June 30, 2006. On August 16, 2006, having reviewed the project record, including the appeal and the Appeal Reviewing Officer’s recommendation, Appeal Deciding Officer Tom Wagner reversed District Ranger Terry Miller’s Decision Notice on the narrow issue of effects disclosure related to the Ellis River Scenic River Eligibility.

This *revised* Environmental Assessment addresses the issues contained in the June 30, 2006, appeal, incorporates guidance from a recent Ninth Circuit Court ruling regarding the 2001 Roadless Conservation Rule, and complies with NEPA requirements and the Forest Plan.

This *revised* Environmental Assessment will be sent to those who responded during the January/February 2006 Public Comment Period, and to the Appellants (of the original Decision). A Legal Notice of the 30-day comment period will be published in the *Manchester Union Leader*. This EA will also be available on the White Mountain National Forest Web site <www.fs.fed.us/r9/forests/white_mountain>.

Reference Appendix B for more information on “Where this Project is in the Forest Service NEPA Process.”

Applicable Regulatory Requirements and Required Coordination

NFMA (National Forest Management Act)

NFMA gives direction for developing, maintaining, and revising plans for individual units of the National Forest System. This includes direction for maintaining multiple use and sustained yield of forest products and services, insuring consideration of environmental aspects of various systems of resource management, providing for diversity of plant and animal communities, and insuring that timber will be harvested only where suitable. This document is tiered to the 2005 White Mountain National Forest Land and Resource Management Plan, which provides direction for managing Forest resources and lands, including timber resources and wildlife habitat.

NEPA (National Environmental Policy Act)

NEPA gives direction to analyze environmental conditions and consequences of planned and proposed actions. Council on Environmental Quality regulations and the Forest Service Manual and Handbooks give direction and guidelines for conducting the analysis.

New Hampshire SHPO (State Historic Preservation Officer) Review

The Cultural Resources report for this project has been sent to the State Historic Preservation Office (SHPO) for review. Concurrence from SHPO was received on January 17, 2006.

MBTA (Migratory Bird Treaty Act)

This project is consistent with the Migratory Bird Treaty Act. The White Mountain National Forest is actively involved with Partners in Flight program to protect neo-tropical migrants. Concerns for species identified through the Species Viability Evaluation (SVE), or in the Biological Evaluation, including migratory birds, have been addressed in the project's final design.

USFWS (United States Fish and Wildlife Service)

The USFWS has reviewed the Biological Evaluation (BE) for federally listed threatened and endangered species (TES).

Issues Used to Develop Alternatives

Issues were identified by the interdisciplinary team through discussions with potentially affected parties, the Town of Jackson, and with publics who commented on the project.

Issues are presented in two groups: "Issues Used to Develop Alternatives" and "Other Issues Brought Forward during Public Involvement." Issues Used to Develop Alternatives are typically used to develop site-specific alternatives. Measurement indicators were developed for these two issues and are a means of comparing the alternatives. "Other Issues Brought Forward During Public Involvement" are resolved through project design, including mitigations, or are resolved at a higher level including 1) *outside*

the scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. NEPA regulations require this delineation in Sec 1501.7, "... identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)."

The interdisciplinary team studied the known issues and identified the following **Issues Used to Develop Alternatives**. "Measurement Indicators" are identified for each issue and are used in Chapter 2 for the Comparison of Alternatives (Table 7).

1. *Effect that winter timber haul on NFSR 233 and 512 would have on Nordic Skiing*

Measurement Indicators:

- Miles of Nordic trail affected
- Miles of new ski trail proposed

2. *Effect of harvest openings on scenery as viewed from Carter Notch, Hall's Ledge, Black Mountain Cabin, Bear Peak, Wildcat Peak, Iron Mountain and Mount Washington*

Measurement Indicator:

- Acres of openings (clearcuts) viewed

3. *Effect that proposed actions would have on roadless and wilderness characteristics of the Wild River Inventoried Roadless Area (IRA)*

Measurement Indicators:

- Acres of regeneration harvest and total harvest (cumulatively) within Wild River IRA
- Miles of new road added to, and cumulatively, within the Wild River IRA

4. *Wildlife (silvicultural treatments) and Aquatic habitat enhancements*

Measurement Indicators:

- Acres of early successional habitat created
- Acres of softwood habitat enhanced
- Miles of stream receiving aquatic and riparian enhancement via placement of large wood
- Acres of increased timber quality and improved species composition
- Water quality effects resulting from the proposed action and connected actions

Issues Addressed by Meeting Forest Plan Standards and Guidelines

In accordance with CEQ § 1500.4(c)(d), the following issues will be incorporated into discussions in Chapter 3 of the completed Environmental Assessment. The issues listed in this section are limited in extent, duration, and intensity, and were not used to generate an alternative. These issues are of such context, duration and intensity that they are resolved by project design and mitigations.

- Avoid impacting historical sites within the Project Area.
- Ensure that Forest Plan Standards and Guidelines are met so that soil and water quality effects are within the anticipated effects displayed in the Final Environmental Impact Statement (FEIS) and Record of Decision (ROD) for the White Mountain National Forest Land and Resource Management Plan.
- Ensure public safety on Carter Notch Road and in the Project Area.

Issues raised by the Public during Scoping

In addition to the issues listed above, the following public comments were received and used to develop or modify the alternatives. Public comments received to date are addressed in this revised EA. For example, the omission of units 21 and 22 under all alternatives responds to several specific comments. Previous public comments are available at the Saco District Office. Some of the key public issues are:

- “Effects to hiking trails, specifically the Wild River Trail and the Bog Brook Trail.”
- “Forest Service data from 1983, 1997 and 2003 shows a clearly maturing and aging forest in the region with fewer and fewer acres in early successional stages. Than Project only proposes 180 acres of regeneration harvest and should include additional acres to meet the displayed 340 acre need.” “Wildlife Habitat management goals are listed but the project fails to fully consider the goals for vegetation management.” “The HMUs collectively for Than Project need 2,907 additional acres of spruce-fir to meet the desired future condition during the Plan period. Adding additional high-thinning or overstory removals in hardwood stands with softwood understory would meet this need.”
- “Than Project will result in Negative Adverse Impacts on the Wildcat WSR, the Appalachian Trail, and the Semi-Primitive Non-Motorized (SPNM) Areas because the project proposal envisions crossing the headwaters and a tributary of the proposed Wildcat Wild and Scenic River (WSR) corridor to access stands 21 and 22.” “Units 21 and 22 should be eliminated entirely, given their proximity to the Federally designated Wildcat River, and their stand alone status as units.”

Chapter 2 – Alternatives

Formulation of Alternatives

This chapter provides a detailed description of the Proposed Action and Alternatives to the Proposed Action. Alternative 1, referred to as the “No Action” alternative, proposes no management activities within the Than Project Area. Consideration of a No Action alternative is required by regulations implementing the National Environmental Policy Act (NEPA), and is intended to contrast the effects of no action to the effects of the action alternatives. Alternatives 2 through 5 are referred to as “Action Alternatives.” They each propose vegetative and other resource management within the Than Project Area. Connected Actions, planned under all of the action alternatives, are described last in the description of alternatives.

Each action alternative responds to varying degrees to the “need for change” described in the Purpose and Need section of Chapter 1, and to public issues.

Alternative 2 is the “Proposed Action” described in Chapter 1.

Alternative 3 responds to known public concern about impacts to Nordic skiing opportunities on NFSR 512. This alternative reduces potential effects on Nordic skiing by limiting harvest activities to summer, fall, and up to December 15 of each year on units accessed via NFSR 512. In the event snow has not arrived, the purchaser would be allowed to continue operations until adequate snow is predicted.

Alternatives 4 and 5 were developed in response to public comments received following the public comment period.

Additional changes to Alternatives 2-4 occurred following the original decision, due to national direction related to the 2001 Roadless Conservation Rule. The revised alternatives are described below.

Each Action Alternative meets, to varying degrees, the Purpose and Need for Action described in Chapter 1. Compartment records and intensive field data was collected from stands within the Wildcat River HMU to identify stands that would benefit from silvicultural treatments. Site specific soil, water, recreation, scenery, and wildlife concerns are addressed through project design and alternative design.

The Forest Plan lists Standards and Guidelines designed to guide forest management activities. They reduce or limit environmental effects from timber harvesting, road construction, road maintenance, and other project implementation. The Standards and Guidelines direct activities on the White Mountain National Forest and are incorporated into this project.

Additional mitigation measures that go above and beyond Forest Plan Standards and Guidelines address concerns specific to the Proposed Action and its alternatives. These site-specific measures (described in Appendix A) have been developed through ongoing research, and result from monitoring and evaluation of similar actions on the White Mountain National Forest over the past 16 years.

Description of Alternatives

Alternative 1: No Action

While this alternative does not meet the Purpose and Need for Action, it does provide a basis for analyzing the effects of conducting no management activities (No Action) in the analysis area, and comparing these effects with those alternatives that propose some level of management. This alternative is required by regulations implementing the National Environmental Policy Act (NEPA). This alternative would not harvest any trees, construct any roads or ski trails, implement aquatic or wildlife habitat improvements, or implement the connected actions. This alternative would not meet Forest Plan expectations for wildlife and aquatic habitat management in these two HMUs or contribute toward providing a sustained yield of timber products toward Forest Plan goals. See Figures 1-6 for informative maps of the analysis area and Figures 7-10 for Alternative Maps.

There would be no change to the existing condition of the area except from natural occurrences, ongoing recreation activities, and road and trail maintenance. This alternative provides a foundation for describing and comparing the magnitude of environmental changes associated with the Action Alternatives against those that are already occurring in the analysis area. This alternative responds to those who want no timber harvesting or active wildlife habitat management. The term “No-Action” means no management action at this time.

Alternative 2: Proposed Action

The Proposed Action and its Connected Actions were developed to optimize the Purpose and Need for Action with the most current information available. It would move the HMUs toward attaining wildlife habitat diversity objectives and other Forest Plan goals – creating early successional habitat, increasing softwood development, and providing for sustained timber production.

Alternative 2 responds to the Purpose and Need for action in the following ways.

Promote desired vegetation and habitat conditions outlined in the Forest Plan and produce forest products to benefit the regional economy.

- Increase early successional habitat by creating up to 181 acres of hardwood regeneration habitat through clearcutting and shelterwood.
- Enhance softwood composition and improve wildlife habitat through approximately 364 acres of group and single-tree selection harvests.
- Improve timber quality and species composition in hardwood areas through approximately 318 acres of commercial thinning and 66 acres of group and single-tree selection treatments.
- Place five temporary skidder bridges over perennial streams to keep equipment and logs out of brooks during skidding.

- Use five existing landings, and construct two new landings.

Maintain or improve the existing transportation system needed for management and public access.

- Perform road maintenance and/or rock surfacing on up to 3.0 miles of existing roads.
- Reconstruct Forest Road 512 (1.8 miles) and the end of Forest Road 233 (0.36 miles) to allow for summer and fall harvest activities.
- Reconstruct 1,500 feet of NFSR 5555 (Ellis River Crossing) to a three season road, with a temporary bridge and permanent abutments at the Ellis River crossing.
- Reconstruct 2,000 feet of low standard road with Right-of-Way across Jackson's Prospect Farm, and construct 500 feet of low standard new road to access National Forest and a landing for units 18-20.
- Remove all temporary drainage structures and temporary bridges, treat needed areas for erosion (seeding and waterbars), and return previously closed roads to a closed intermittent status at the conclusion of this project.

Improve wildlife and aquatic habitat in the area.

- Place woody debris using hand tools on up to 6 miles of Bog, Wildcat, and Davis Brooks and Wildcat River to add aquatic habitat structure and diversity by creating pools and cover. In addition, downed wood may be added to the riparian area adjacent to the stream where evidence of eroding side channels occur. The wood to be added would come from trees at the site, and be secured via existing natural features such as streambank contours, tree roots or rocks, or allowed to cause "debris-jams."

Maintain or improve recreation opportunities in the area.

- Relocate 500 feet of Wildcat River Trail above FSR 233 to eliminate existing erosion on the trail.

Estimated Outputs Under Alternative 2

Alternative 2 would provide approximately 5.6 million board feet of sawtimber and pulpwood, and improve future stand quality and productivity.

This alternative responds to the need to create hardwood early-successional habitat and to increase the softwood component in mixedwood stands. It would create 181 acres of early-successional habitat (forest stands 0-9 years old). Natural regeneration with paper birch, yellow birch, pin cherry, red maple, and sugar maple is expected in clearcut and shelterwood units.

Using group and single tree selection treatments, this alternative responds to the need to increase the softwood component on 364 acres. Thinning and single-tree selection in 384 acres of hardwood stands would reduce stand density while maintaining a forested stand and increasing tree size and vigor.

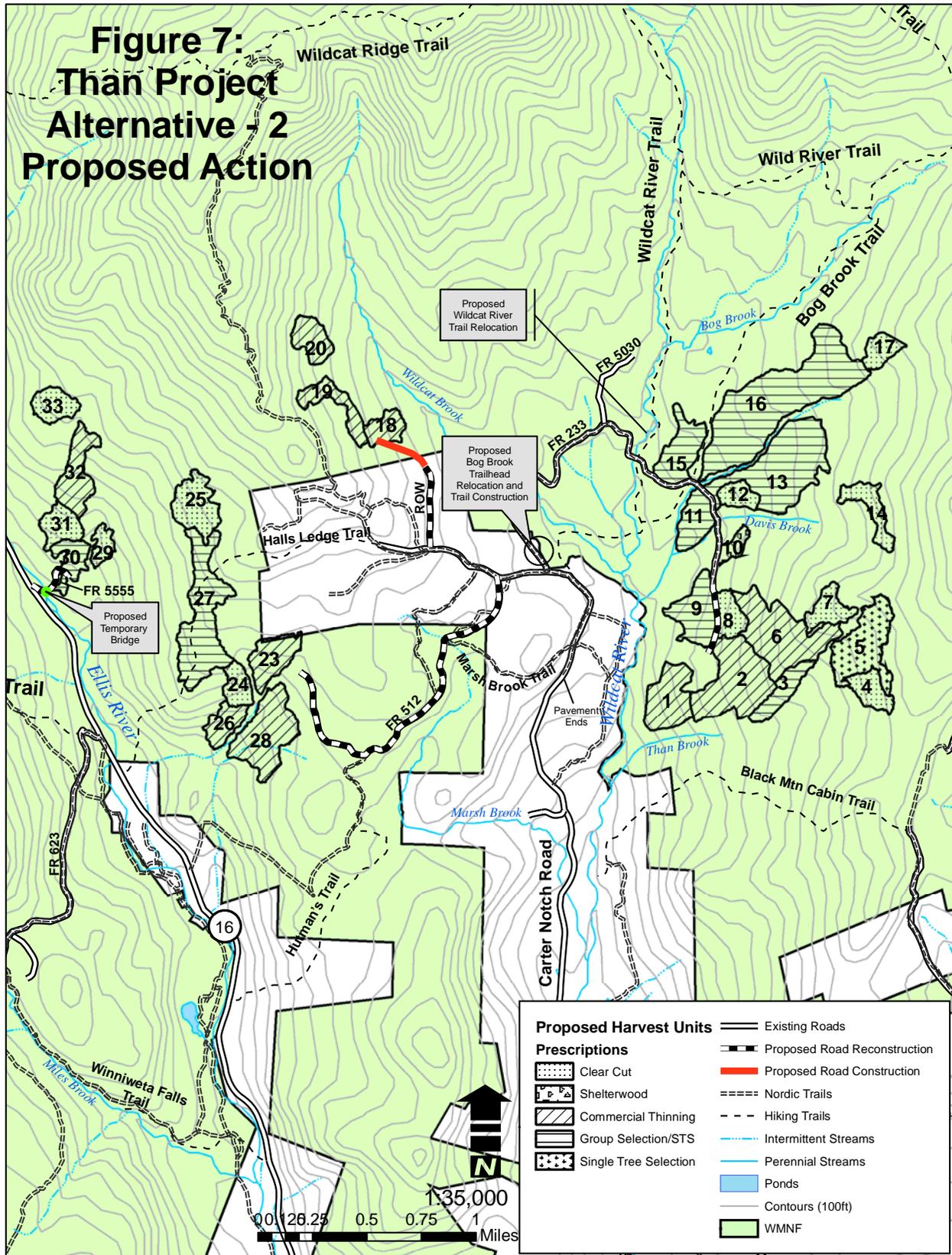


Table 2. Than Project Alternative 2 (Proposed Action)

Unit	Forest Type	Acres	Treatment Objective	Harvest Method	Operating Season
1	Hardwood	33	Quality hardwood	Thin	Fall/winter
2	Hardwood	59	Quality hardwood	Thin	Fall/winter
3	Mixedwood	18	Softwood development	Group Sel/STS	Winter
4	Hardwood	16	Regeneration	CC	SFW
5	Mixedwood	45	Softwood development	STS	Winter
6	Hardwood	61	Quality hardwood	Thin	Fall/winter
7	Hardwood	16	Regeneration	CC	SFW
8	Hardwood	15	Regeneration	CC	SFW
9	Mixedwood	32	Softwood development	Group Sel/STS	Winter
10	Hardwood	8	Regeneration	Shelterwood	Summer/fall
11	Mixedwood	22	Softwood development	Group Sel/STS	Winter
12	Hardwood	11	Regeneration	CC	SFW
13	Mixedwood	76	Softwood development	Group Sel/STS	Winter
14	Hardwood	18	Regeneration	CC	SFW
15	Mixedwood	30	Softwood development	Group Sel/STS	Fall/winter
16	Mixedwood	126	Softwood development	Group Sel/STS	Winter
17	Hardwood	13	Regeneration	CC	SFW
18	Hardwood	14	Quality hardwood	Thin	Fall/winter
19	Hardwood	19	Quality hardwood	Thin	Fall/winter
20	Hardwood	18	Quality hardwood	Thin	Fall/winter
23	Hardwood	23	Quality hardwood	Thin	Fall/winter
24	Hardwood	13	Regeneration	CC	SFW
25	Hardwood	29	Regeneration	CC	SFW
26	Hardwood	16	Quality hardwood	Thin	Fall/winter
27	Hardwood	64	Softwood, Q hardwood	Group Sel/STS	Fall/winter
28	Hardwood	47	Quality hardwood	Thin	Fall/winter
29	Hardwood	9	Regeneration	CC	SFW
30	Mixedwood	16	Softwood and Q hardwood	Group Sel/STS	Fall/winter
31	Hardwood	17	Regeneration	CC	SFW
32	Hardwood	29	Quality hardwood	Thin	Fall/winter
33	Hardwood	16	Regeneration	CC	SFW
Sum		929			

Table KEY:

Harvest Method: the silvicultural prescription, or type of harvest proposed for a given Unit.

Group Selection= small openings averaging 1/2 acre, spaced throughout, and treating up to 20 % of a Unit.

Than Forest Resource Management Project – Environmental Assessment

STS= Single Tree Selection, an uneven age management system that retains a representation of existing species and ages of trees while reducing stand density to an approximate Basal Area of 80 to 90 square feet.

CC= Clearcut, a cut method that removes all trees except reserve patches and creates an opening for regeneration of new trees.

Thin = Thinning a stand by removing smaller trees, damaged trees and low value or short lived trees to a Basal Area of 70 square feet.

Forest Type – represents the primary species composition and stand age of a Unit.

Treatment objective –harvest methods are designed (prescribed) to meet the Purpose and Need for action, or treatment in each Unit, resulting in development of a particular type of vegetative habitat.

Operating Season - Time of year when harvest activities are scheduled to occur. Operating is allowed during the specified season. Activities may occasionally occur outside these periods when soil conditions and other resource considerations allow.

SFW= Summer, Fall, and Winter operating seasons.

Road maintenance, pre-commercial timber stand improvement, trailhead relocation, hiking trail, and aquatic, and wildlife habitat improvements would occur under this alternative.

Alternative 3

Alternative 3, along with its Connected Actions, responds to known or anticipated public concerns about impacts from winter logging on Nordic skiing opportunities within the analysis area. This alternative reduces potential effects on Nordic skiing in the portion of the analysis area accessed via NFSR 512 by limiting harvest activities to summer and fall, up to December 15 of each year. The restriction on winter harvest would extend the contract period over a greater number of years.

To a similar degree as the Proposed Action, Alternative 3 would move these HMUs toward attaining wildlife habitat diversity objectives and other Forest Plan goals, including creating early successional habitat, increasing softwood development, and providing for sustained timber production. This alternative may require more operating seasons to complete the project, but would also increase recreation opportunities and improve wildlife and aquatic habitat.

Alternative 3 attempts to respond to the Purpose and Need for action in the following ways.

Promote desired vegetation and habitat conditions outlined in the Forest Plan and produces forest products to benefit the regional economy.

- Create 181 acres of hardwood early-successional habitat through clearcutting and shelterwood.
- Enhance softwood habitat through approximately 364 acres of group and single-tree selection harvests.
- Improve timber quality and species composition in hardwood stands through approximately 318 acres of commercial thinning and 66 acres of group/single tree selection.
- Place five temporary skidder bridges over perennial streams to keep equipment and logs out of brooks during skidding.
- Use five existing landings and construct two new landings.

Maintain or improve the existing transportation system needed for management and public access.

- Perform road maintenance and/or rock surfacing on up to 3.0 miles of existing roads.
- Reconstruct Forest Road 512 (1.8 miles) and the end of Forest Road 233 (0.36 miles) to allow for summer and fall harvest activities.
- Reconstruct 1,500 feet of NFSR 5555 (Ellis River Crossing) to a three season road, with a temporary bridge and permanent abutments at the Ellis River crossing.
- Reconstruct 2,000 feet of low standard road with Right-of-Way across Jackson's Prospect Farm, and construct 500 feet of low standard new road to access National Forest and a landing for Units 18-20.
- Remove all temporary drainage structures and temporary bridges, treat needed areas for erosion (seeding and waterbars), and return

previously closed roads to a closed intermittent status at the conclusion of this project.

Improve wildlife and aquatic habitat in the area.

- Place woody debris using hand tools on up to 6 miles of Bog, Wildcat, and Davis Brooks and Wildcat River to add aquatic habitat structure and diversity by creating pools and cover. In addition, downed wood may be added to the riparian area adjacent to the stream where evidence of eroding side channels occur. The wood to be added would come from trees at the site, and be secured via existing natural features such as streambank contours, tree roots or rocks, or allowed to cause “debris-jams.”

Maintain or improve recreation opportunities in the area.

- Relocate 500 feet of Wildcat River Trail above FSR 233 to eliminate existing erosion on the trail.
- Provide for a future Nordic trail from the end of Boggy Brook Nordic Trail (at the end of the NFSR 233 Road) easterly to East Pasture Trail, a straight line distance of approximately 1 mile with a true trail distance of about 2 miles. Up to half the length would be within harvested areas.

Estimated Outputs

Alternative 3 would provide approximately 5.6 million board feet of sawtimber and pulpwood, and improve future stand quality and productivity.

This alternative responds to the need to create hardwood early successional habitat and to increase the softwood component in mixedwood stands. This alternative would create 181 acres of early-successional habitat (forest stands 0-9 years old). Natural regeneration with paper birch, yellow birch, pin cherry, red maple, and sugar maple is expected in clearcut and shelterwood units.

Using group and single tree selection treatments, this alternative responds to the need to increase the softwood component on 364 acres. Thinning and single-tree selection in 384 acres of hardwood stands would reduce stand density while maintaining a forested stand and increasing tree size and vigor.

Road maintenance, pre-commercial timber stand improvement, trailhead relocation, hiking trail, a Nordic connecting trail, and aquatic and wildlife habitat improvements would occur under this alternative.

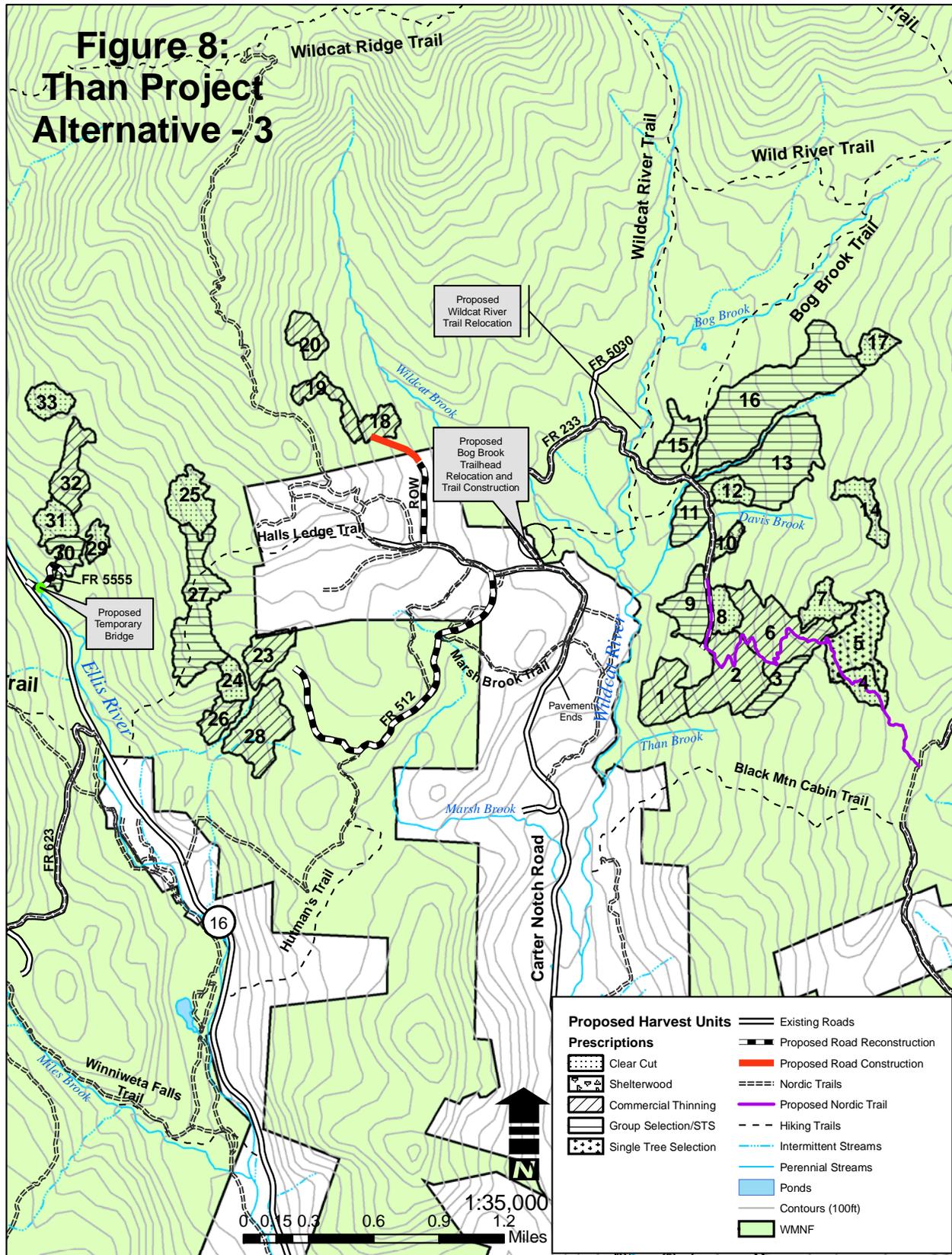


Table 3. Than Project Alternative 3

Unit	Forest Type	Acre	Treatment Objective	Harvest Method	Operating Season
1	Hardwood	33	Quality hardwood	Thin	Fall/winter
2	Hardwood	59	Quality hardwood	Thin	Fall/winter
3	Mixedwood	18	Softwood development	Group Sel/STS	Winter
4	Hardwood	16	Regeneration	CC	SFW
5	Mixedwood	45	Softwood development	STS	Winter
6	Hardwood	61	Quality hardwood	Thin	Fall/winter
7	Hardwood	16	Regeneration	CC	SFW
8	Hardwood	15	Regeneration	CC	SFW
9	Mixedwood	32	Softwood development	Group Sel/STS	Winter
10	Hardwood	8	Regeneration	Shelterwood	Summer/fall
11	Mixedwood	22	Softwood development	Group Sel/STS	Winter
12	Hardwood	11	Regeneration	CC	SFW
13	Mixedwood	76	Softwood development	Group Sel/STS	Winter
14	Hardwood	18	Regeneration	CC	SFW
15	Mixedwood	30	Softwood development	Group Sel/STS	Fall/winter
16	Mixedwood	126	Softwood development	Group Sel/STS	Winter
17	Hardwood	13	Regeneration	CC	SFW
18	Hardwood	14	Quality hardwood	Thin	Fall
19	Hardwood	19	Quality hardwood	Thin	Fall
20	Hardwood	18	Quality hardwood	Thin	Fall
23	Hardwood	23	Quality hardwood	Thin	Fall
24	Hardwood	13	Regeneration	CC	Summer/fall
25	Hardwood	29	Regeneration	CC	Summer/fall
26	Hardwood	16	Quality hardwood	Thin	Fall
27	Hardwood	64	Softwood, Q hardwood	Group Sel/STS	Fall
28	Hardwood	47	Quality hardwood	Thin	Fall
29	Hardwood	9	Regeneration	CC	SFW
30	Mixedwood	16	Softwood and Q hardwood	Group Sel/STS	Fall/winter
31	Hardwood	17	Regeneration	CC	SFW
32	Hardwood	29	Quality hardwood	Thin	Fall/winter
33	Hardwood	16	Regeneration	CC	SFW
Sum		929			

Table KEY:

Harvest Method: the silvicultural prescription, or type of harvest proposed for a given Unit.

Group Selection= small openings averaging 1/2 acre, spaced throughout, and treating up to 20 % of a Unit.

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STS= Single Tree Selection, an uneven age management system that retains a representation of existing species and ages of trees while reducing stand density to an approximate Basal Area of 80 to 90 square feet.

CC= Clearcut, a cut method that removes all merchantable trees except in reserve patches, and creates an opening for regeneration of new trees.

Thin = Thinning a stand by removing smaller trees, damaged trees and low value or short lived trees to a Basal Area of 70 square feet.

Forest Type – represents the primary species composition of the Unit.

Treatment objective –harvest methods are designed to meet the Purpose and Need for treatment in each Unit, resulting in development of a particular type of vegetative habitat.

Operating Season - Time of year when harvest activities are scheduled to occur. Operating is allowed during the specified season. Activities may occasionally occur outside these periods when soil conditions and other resource considerations allow.

SFW= Summer, Fall, and Winter operating seasons.

Alternative 4

Alternative 4, along with its Connected Actions, responds to issues raised by the public during the Comment Period while meeting important components of the Proposed Action to meet the Purpose and Need. This alternative limits the season of harvest up to December 15 of each year on NFSR 512 (except for units 28 and 37); it reduces road construction from 500 feet to approximately 200 feet on the National Forest to access units 18-20; and it modifies prescriptions on three thinning units, resulting in an increase of fifty acres of regeneration harvest and reducing visual concerns from the Halls Ledge viewpoint by converting 6 acres of Unit 25 to a shelterwood prescription. All of these adjustments are directly related to comments received from the public. The restriction on winter harvest would likely extend the contract period over a greater number of years.

To nearly the same degree as the Proposed Action, this alternative would move these HMUs toward attaining wildlife habitat diversity objectives and other Forest Plan goals, including creating early successional habitat, increasing softwood development, and providing for sustained timber production. Alternative 4 may require more operating seasons to complete the project, but it would also increase recreation opportunities and improve wildlife and aquatic habitat.

Alternative 4 attempts to respond to the Purpose and Need for action in the following ways.

Promote desired vegetation and habitat conditions outlined in the Forest Plan and produce forest products to benefit the regional economy.

- Create 231 acres of hardwood early successional habitat through clearcutting and shelterwood harvests.
- Enhance softwood habitat through approximately 364 acres of group and single-tree selection harvests.
- Improve timber quality and species composition in hardwood stands through approximately 333 acres of commercial thinning and group and single tree selection.
- Place five temporary skidder bridges over perennial streams to keep equipment and logs out of brooks during skidding.
- Use five existing landings and construct two new landings.

Maintain or improve the existing transportation system needed for management and public access.

- Perform road maintenance and/or rock surfacing on up to 3.0 miles of existing roads.
- Reconstruct Forest Road 512 (1.8 miles) and the end of Forest Road 233 (0.36 miles) to allow for summer and fall harvest activities.
- Reconstruct 1,500 feet of NFSR 5555 (Ellis River Crossing) to a three season road, with a temporary bridge and permanent abutments at the Ellis River crossing.

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- Reconstruct 2,000 feet of low standard road with Right-of-Way across Jackson's Prospect Farm, and construct approximately 200 feet of low standard road and a landing on National Forest to serve Units 18-20.
- Remove all temporary drainage structures and temporary bridges, treat needed areas for erosion (seeding and waterbars), and return previously closed roads to a closed intermittent status at the conclusion of this project.

Improve wildlife and aquatic habitat in the area.

- Place woody debris using hand tools on up to 6 miles of Bog, Wildcat, and Davis Brooks and Wildcat River to add structure to add aquatic habitat structure and diversity by creating pools and cover. Downed wood may be added to the riparian area adjacent to these brooks where eroding of minor side channels exists now. The wood to be added would come from trees at the site, and be secured via existing natural features such as streambank contours, tree roots or rocks, or allowed to cause "debris-jams."

Maintain or improve recreation opportunities in the area.

- Relocate 500 feet of Wildcat River Trail above FSR 233 to eliminate existing erosion on the trail.
- Provide for a future Nordic trail from the end of Boggy Brook Nordic Trail (at the end of the NFSR 233 Road) easterly to East Pasture Trail, a straight line distance of approximately 1 mile with a true trail distance of about 2.0 miles. Up to half the length would be within harvested areas.

Estimated Outputs

Alternative 4 would provide approximately 6.0 million board feet of sawtimber and pulpwood, and improve future stand quality and productivity.

This alternative responds to the need to create hardwood early successional habitat and to increase softwood component in mixedwood stands. This alternative would create 231 acres of early-successional habitat (forest stands 0-9 years old) using clearcuts and shelterwood treatments. Natural regeneration with paper birch, yellow birch, pin cherry, red maple and sugar maple is expected in these units.

Using group and single tree selection treatments, this alternative responds to the need to increase the softwood component on 364 acres. Thinning and single-tree selection in 333 acres of hardwood stands would reduce stand density while maintaining a forested stand and increasing tree size and vigor.

Road maintenance, pre-commercial timber stand improvement, trailhead relocation, hiking trail, a Nordic connecting trail, and aquatic and wildlife habitat improvements would occur under this alternative.

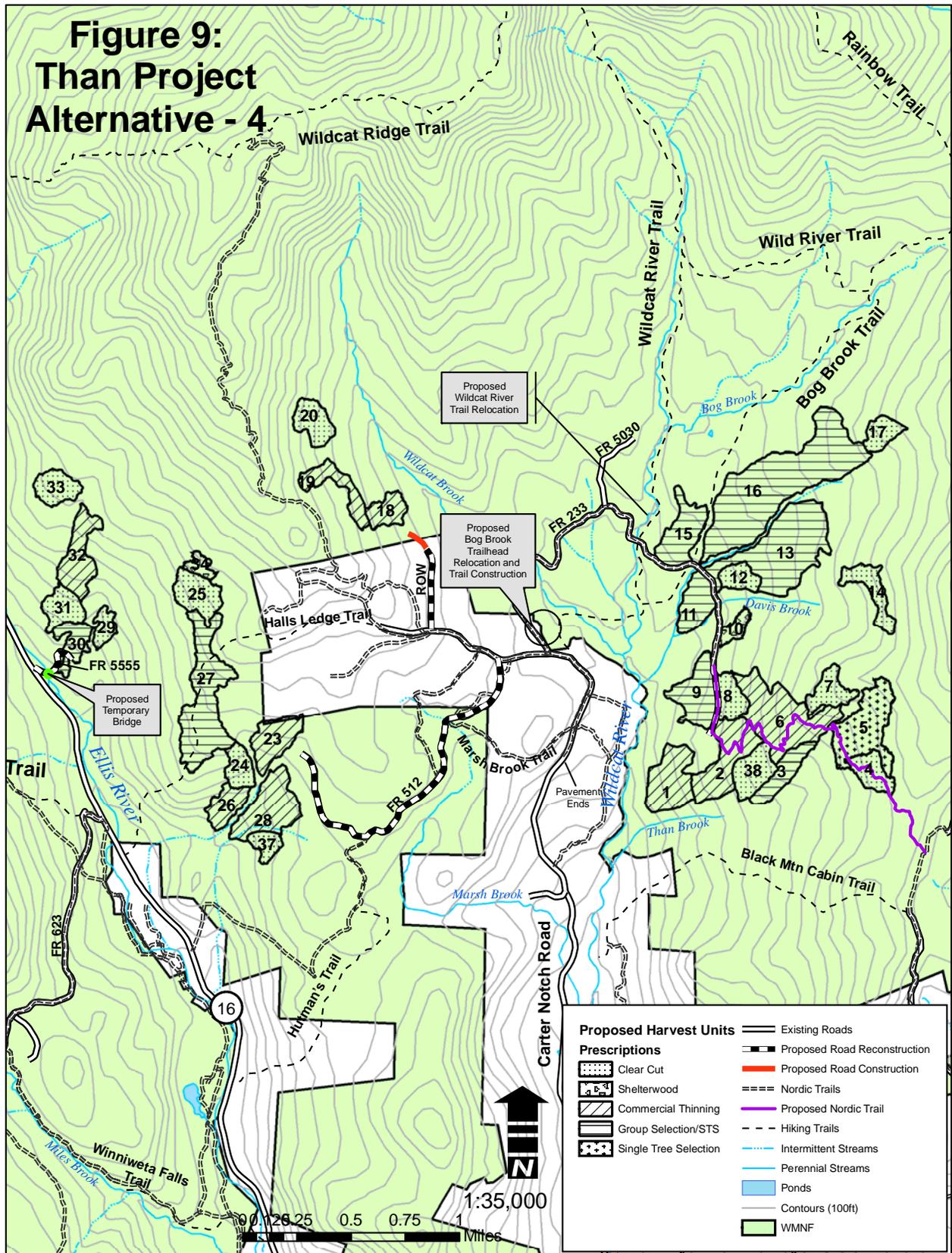


Table 4. Than Project Alternative 4

Unit	Forest Type	Acre	Treatment Objective	Harvest Method	Operating Season
1	Hardwood	33	Quality hardwood	Thin	Fall/winter
2	Hardwood	37	Quality hardwood	Thin	Fall/winter
3	Mixedwood	18	Softwood development	Group Sel/STS	Winter
4	Hardwood	16	Regeneration	CC	SFW
5	Mixedwood	45	Softwood development	STS	Winter
6	Hardwood	61	Quality hardwood	Thin	Fall/winter
7	Hardwood	16	Regeneration	CC	SFW
8	Hardwood	15	Regeneration	CC	SFW
9	Mixedwood	32	Softwood development	Group Sel/STS	Winter
10	Hardwood	8	Regeneration	Shelterwood	Summer/fall
11	Mixedwood	22	Softwood development	Group Sel/STS	Winter
12	Hardwood	11	Regeneration	CC	SFW
13	Mixedwood	76	Softwood development	Group Sel/STS	Winter
14	Hardwood	18	Regeneration	CC	SFW
15	Mixedwood	30	Softwood development	Group Sel/STS	Fall/winter
16	Mixedwood	126	Softwood development	Group Sel/STS	Winter
17	Hardwood	13	Regeneration	CC	SFW
18	Hardwood	14	Quality hardwood	Thin	Fall
19	Hardwood	19	Quality hardwood	Thin	Fall
20	Hardwood	18	Regeneration	CC	Summer/Fall
23	Hardwood	23	Quality hardwood	Thin	Fall
24	Hardwood	13	Regeneration	CC	Summer/fall
25	Hardwood	23	Regeneration	CC	Summer/fall
26	Hardwood	16	Quality hardwood	Thin	Fall
27	Hardwood	64	Uneven-aged Mgmt.	Group Sel/STS	Fall
28	Hardwood	37	Quality hardwood	Thin	Fall/winter
29	Hardwood	9	Regeneration	CC	SFW
30	Mixedwood	16	Softwood and Q hardwood	Group Sel/STS	Fall/winter
31	Hardwood	17	Regeneration	CC	SFW
32	Hardwood	29	Quality hardwood	Thin	Fall/winter
33	Hardwood	16	Regeneration	CC	SFW
34	Hardwood	6	Regeneration	Shelterwood	Summer/Fall
37	Hardwood	10	Regeneration	CC	SFW
38	Hardwood	22	Regeneration	CC	SFW
Sum		929			

Table KEY:

Harvest Method: the silvicultural prescription, or type of harvest proposed for a given Unit.

Group Selection= small openings averaging 1/2 acre, spaced throughout, and treating up to 20 % of a Unit.

STS= Single Tree Selection, an uneven age management system that retains a representation of existing species and ages of trees while reducing stand density to an approximate Basal Area of 80 to 90 square feet.

CC= Clearcut, a cut method that removes all merchantable trees except in reserve patches, and creates an opening for regeneration of new trees.

Thin = Thinning a stand by removing smaller trees, damaged trees and low value or short lived trees to a Basal Area of 70 square feet.

Forest Type – represents the primary species composition of the Unit.

Treatment objective –harvest methods are designed to meet the Purpose and Need for treatment in each Unit, resulting in development of a particular type of vegetative habitat.

Operating Season - Time of year when harvest activities are scheduled to occur. Operating is allowed during the specified season. Activities may occasionally occur outside these periods when soil conditions and other resource considerations allow.

SFW= Summer, Fall, and Winter operating seasons.

Alternative 5

Alternative 5, along with its Connected Actions, responds to the issue raised by the public during the Comment Period that an alternative be developed that “Does Not Log or Build Roads in the Wild River IRA,” a 2004 inventoried roadless area examined during the Forest Plan Revision process. This alternative eliminates silvicultural treatments and fishery enhancements and the need for 500 feet of proposed road construction (adjacent to Prospect Farm) *within* the IRA. Alternative 5 does *not* limit winter harvesting on NFSR 512. These adjustments are directly related to comments received from the public.

Alternative 5 addresses current recreation-related issues. It would move *only* the Wildcat River HMU toward attaining wildlife habitat diversity objectives and other Forest Plan goals. Alternative 5 does this to a much smaller degree than the Proposed Action or Alternatives 3 and 4. These goals include creating early successional habitat, increasing softwood development, and providing for sustained timber production. Alternative 5 achieves *no* wildlife habitat objectives in the Ellis River HMU.

Alternative 5 responds to the Purpose and Need for action in the following ways.

Promote desired vegetation and habitat conditions outlined in the Forest Plan and produces forest products to benefit the regional economy.

- Increase early-successional habitat by creating up to 60 acres of hardwood regeneration habitat through clearcutting.
- Enhance softwood composition and improve wildlife habitat through approximately 110 acres of group and single-tree selection.
- Improve timber quality and species composition in hardwood areas through approximately 239 acres of commercial thinning, 8 acres in shelterwood, and 45 acres of single-tree selection.
- Place three temporary skidder bridges over perennial streams to keep equipment and logs out of brooks during skidding.
- Use three existing landings.

Maintain or improve the existing transportation system needed for management and public access.

- Perform road maintenance and/or rock surfacing on up to 3.0 miles of existing road (NFSR 233).
- Reconstruct Forest Road 512 (1.8 miles) and the end of Forest Road 233 (0.36 miles) to allow for summer and fall harvest activities.
- Remove all temporary drainage structures and temporary bridges, treat needed areas for erosion (seeding and waterbars), and return previously closed roads to a closed intermittent status at the conclusion of this project.

Improve wildlife and aquatic habitat in the area.

- Place woody debris using hand tools on up to a mile of Davis Brook to add aquatic habitat structure and diversity by creating pools and cover. Downed wood may be added to the riparian area adjacent to this brook where erosion of minor side channels exists now. The wood to be added would come from trees at the site, and be secured via existing natural features such as streambank contours, tree roots or rocks, or allowed to cause “debris-jams.”

Maintain or improve recreation opportunities in the area.

- Relocate 500 feet of Wildcat River Trail above FSR 233 to eliminate existing erosion on the trail.

Estimated Outputs under Alternative 5

Alternative 2 would provide approximately 3.0 million board feet of sawtimber and pulpwood, and would improve future stand quality and productivity.

This alternative responds to the need to create hardwood early successional habitat and to increase the softwood component in mixedwood stands. It would create 60 acres of early-successional habitat (forest stands 0-9 years old). Natural regeneration with paper birch, yellow birch, pin cherry, red maple, and sugar maple is expected in clearcut units.

Using group and single tree selection treatments, this alternative responds to the need to increase the softwood component on 110 acres. Thinning (239 acres), shelterwood (8 acres), and single-tree selection (45 acres) in hardwood stands would reduce stand density while maintaining a forested stand and increasing tree size and vigor.

Road maintenance, pre-commercial timber stand improvement, trailhead relocation, hiking trail improvement, and aquatic and wildlife habitat improvements would occur under this alternative.

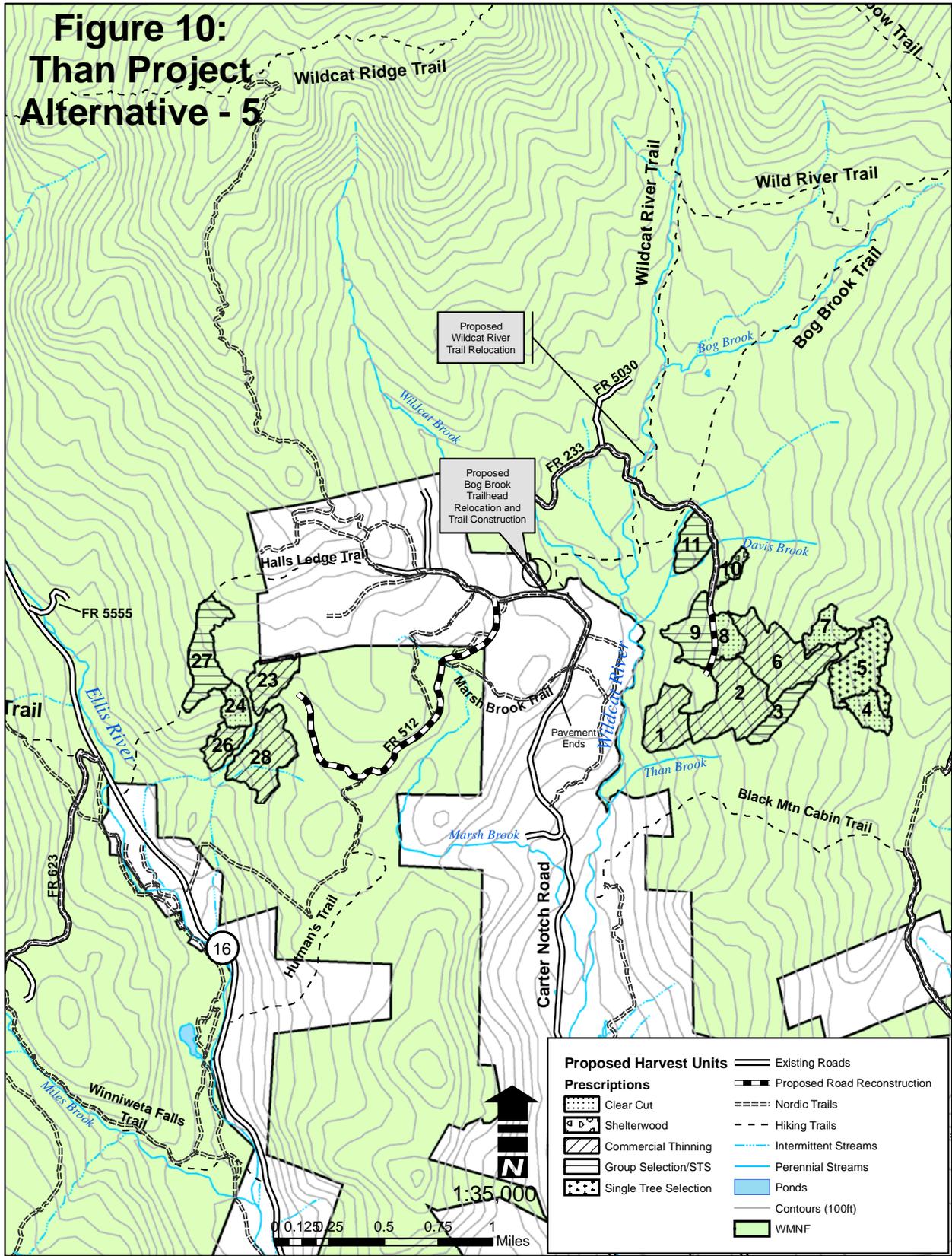


Table 5. Than Project Alternative 5

Unit	Forest Type	Acre	Treatment Objective	Harvest Method	Operating Season
1	Hardwood	33	Quality hardwood	Thin	Fall/winter
2	Hardwood	59	Quality hardwood	Thin	Fall/winter
3	Mixedwood	18	Softwood development	Group Sel/STS	Winter
4	Hardwood	16	Regeneration	CC	SFW
5	Mixedwood	45	Softwood development	STS	Winter
6	Hardwood	61	Quality hardwood	Thin	Fall/winter
7	Hardwood	16	Regeneration	CC	SFW
8	Hardwood	15	Regeneration	CC	SFW
9	Mixedwood	32	Softwood development	Group Sel/STS	Winter
10	Hardwood	8	Regeneration	Shelterwood	Summer/fall
11	Mixedwood	22	Softwood development	Group Sel/STS	Winter
23	Hardwood	23	Quality hardwood	Thin	Fall/winter
24	Hardwood	13	Regeneration	CC	SFW
26	Hardwood	16	Quality hardwood	Thin	Fall/winter
27	Hardwood	38	Softwood, Q hardwood	Group Sel/STS	Fall/winter
28	Hardwood	47	Quality hardwood	Thin	Fall/winter
	Sum	462			

Table KEY:

Harvest Method: the silvicultural prescription, or type of harvest proposed for a given Unit.

Group Selection= small openings averaging 1/2 acre, spaced throughout, and treating up to 20 % of a Unit.

STS= Single Tree Selection, an uneven age management system that retains a representation of existing species and ages of trees while reducing stand density to an approximate Basal Area of 80 to 90 square feet.

CC= Clearcut, a cut method that removes all merchantable trees except in reserve patches, and creates an opening for regeneration of new trees.

Thin = Thinning a stand by removing smaller trees, damaged trees and low value or short lived trees to a Basal Area of 70 square feet.

Forest Type – represents the primary species composition of the Unit.

Treatment objective –harvest methods are designed to meet the Purpose and Need for treatment in each Unit, resulting in development of a particular type of vegetative habitat.

Operating Season - Time of year when harvest activities are scheduled to occur. Operating is allowed during the specified season. Activities may occasionally occur outside these periods when soil conditions and other resource considerations allow.

SFW= Summer, Fall, and Winter operating seasons.

Connected Actions Under All Action Alternatives

- To insure regeneration objectives are met, pre-commercial release of regeneration on up to 100 acres in group selection, single tree selection, and shelterwood units may be implemented.
- Move Bog Brook Trailhead onto National Forest or Town of Jackson lands with an easement or agreement, including approximately 750 feet of connecting trail to the existing trail.
- Remove delapidated structures near the current trailhead for Bog Brook Trail.
- In accordance with the Project Roads Analysis, the following roads are not needed and will be removed from the roads database: NFSR 5020, 5021, 5022, 5024, 5026, 5028, 95440, 95441. These are non-maintained secondary roads or former temporary roads no longer maintained or needed. They may be used as skid trails in the future. Two currently serve as portions of hiking (5026 – Hutmans) or Nordic (5024 – Dana Place) trails. Where these roads serve as hiking trails, their current condition would remain unaffected by this action.
- Whole tree removal would be allowed (but not required) in the following hardwood units: 1, 2, 6, 7, 8, 10, 12, 18-20, 23-25, 33, 34, and 38.

Project Alternatives Considered and Eliminated from Further Study

- *Analyze an alternative that proposes only uneven-aged management.* This alternative was considered and eliminated from further study because it does not meet an important component of the Purpose and Need for the Proposed Action as directed in the White Mountain National Forest Plan. One of the goals for MA 2.1 lands is to provide a balanced mix of habitats for all wildlife species. The Purpose and Need for Action for this project specifically includes creation of early-successional habitat. A detailed discussion regarding the need for early-successional habitat is presented in the Need for Action and Need for Change sections of Chapter 1. The Wildlife effects section in Chapter 3 discusses effects of the No Action alternative and the anticipated habitat diversity that even-aged and uneven-aged management would have. Harvest treatments in the HMUs during the 1950s thru the 1970s are well-stocked hardwood pole-sized stands, and contain mature northern hardwoods that would benefit from thinning. These needs eliminated an uneven-aged management-only alternative from further detailed study. This alternative would not meet the test of being “reasonable.”
- *Summer/Fall Only Harvest for all units.* This alternative was discussed because it would eliminate the concern for dual use of roads in winter, when the roads become Nordic trails. It would also eliminate safety concerns on Carter Notch Road in winter. However, such an alternative would add to road damage and safety concerns in summer, when residential occupancy and tourism are highest. Previous sales

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(Marsh Brook, Wildcat) were winter logged without incident. Units 3, 5, 9, 11, 13, and 16 are best logged on frozen ground due to moist soils. Restricting the project to summer/fall only would require removal of all or portions of these units due to moist soils. Winter logging is feasible, and often desirable, even on units with permeable soils, because it reduces overall soil compaction and erosion. Also, the added flexibility from having a range of seasons in which to implement treatments increases the success in meeting objectives. As a result, this alternative was not developed further.

- **Winter Only Harvest for all units.** This alternative was suggested as a means to reduce potential damage to Carter Notch Road from haul during hot summer months. Operating restrictions on this road can be employed by the Forest Service if damage begins to occur. In addition, the Town of Jackson can post load limits to the road for the same reason during hot periods. This alternative would eliminate the opportunity to meet project objectives to scarify soils during extraction. Scarification increases the likelihood of germinating desirable species in clearcut, group and shelterwood units.

Photo shows a 1/20th acre opening (group selection, Marsh Brook Sale) just west of Spruce Mountain between Wildcat Brook and Ellis River. This opening was created in about 1996. The opening created new regeneration in a dense, mature mixedwood stand typical of mixedwood stands in Than. A group selection with single tree selection would remove some of the hardwood and poorer softwoods seen in the background, as well.



Table 7: Comparison of Alternatives

Measurement Indicators	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Nordic and Hiking Trails+				
Effects to existing Nordic Ski Trails+	Winter-long closures on Quail, UST, Boggy Brook, and Wildcat Trail for 2 to 3 seasons	Winter-long closures on Boggy Brook, Wildcat Valley Trail for 2 to 3 seasons	Winter-long closures on Boggy Brook, Wildcat Valley Trail for 2 to 3 seasons	Winter-long closures on Quail, UST Boggy Brook, Wildcat Valley Trail for one to 2 seasons
New Nordic Trail	None	2.0 miles	2.0 miles	None
Scenery and noise near Hiking Trails#	Temporary effects to hiking trails	Temporary effects to hiking trails	Temporary effects to hiking trails	Fewer effects to hiking trails
Scenery				
Estimated <u>acres</u> of new openings seen from identified viewpoints@	Black Mountain: 9 Black Mt Cabin: 5 Wildcat Peak: 33 Washington: 48 Iron Mountain: 54	Black Mountain: 9 Black Mt Cabin: 5 Wildcat Peak: 33 Washington: 48 Iron Mountain: 54	Black Mountain: 22 Black Mt Cabin: 16 Wildcat Peak: 60 Washington: 56 Iron Mountain: 67	Black Mountain: 9 Black Mt Cabin: 5 Wildcat Peak: 20 Washington: 10 Iron Mountain: 15
Overall Effect to Wildcat Scenic River	Minimal effects to values for which it was designated	Minimal effects to values for which was designated	Minimal effects to values for which was designated	Effect limited to Wildcat River trail restoration
Wild River IRA				
Acres of harvest and total harvest within WRRRA*	464 acres added; 937 acres total within WWRA*	464 acres added; 937 acres total within WRRRA*	464 acres added; 937 acres total within WRRRA*	None added, 473 acres total within WRRRA*
Roads added**	500 feet**	500 feet**	200 feet**	None
Wildlife and Aquatics				
Openings created<>	181 acres created	181 acres created	232 acres created	60 acres created
Softwood habitat^	364 acres created	364 acres created	364 acres created	110 acres created
Aquatic and Riparian	5 to 6 miles of improved streams	5 to 6 miles of improved streams	5 to 6 miles of improved streams	1/2 mile of improved stream
Increase Timber Quality and species composition	Selective harvest on 384 acres	Selective harvest on 384 acres	Selective harvest on 333 acres	Selective harvest on 292 acres
Water Quality Effects	Improved road conditions offset short term increases in sedimentation	Improved road conditions offset short term increases in sedimentation	Improved road conditions offset short term increases in sedimentation	improved road conditions offset short term increases in sedimentation

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(NOTE) Disclosure of Affects for the No Action Alternative is described in Chapter 3 for each resource and these management indicators. Under the No Action Alternative, no acres, no miles, no activities and thus no direct effects would take place. The indirect and cumulative effects of No Action are described in Chapter 3 under each of the resources.

+ Under Alternative 4, Quail and UST trails would potentially be closed for one winter, or possibly part of one winter, whereas Wildcat and Boggy Brook trails could be impacted for up to two winters. This is due to units 28 and 37 allowing winter logging under Alternative 4 even though the other units with egress via NFSR 512 do not allow winter logging in Alternative 4.

Affected hiking trails under one or more alternative includes Halls Ledge, Wildcat River, Wild River, and Bog Brook Trails. Alternatives 2 and 3 effect hiking trails equally. The action alternatives would require designated crossing of hiking trails within units (see Figure 4 and Figures 7–10, the Alternative Maps in Chapter 2). The affected hiking trails within units would receive a 50 foot slash treatment zone. All hiking trails adjacent to units under this Project are within partial harvest thins or group/single tree selection. No changes would occur under No Action.

@ The most critical viewpoint was used to estimate openings seen for each alternative and represents the estimated maximum acres seen from that viewpoint. The **sum** of all new openings (clearcuts) potentially seen is shown. These estimates are less than the summation of unit acres due to screening by topographic features and/or trees in front of viewed openings. While not accounted for here, reserve patches planned within these openings would provide additional visual buffers. No new openings would be seen from Carter Notch or the 'ramparts'. The view of units 25 and 33 from Halls Ledge under all alternatives are blocked by trees in the immediate foreground.

* The 71,387 acre Wild River Inventoried Roadless Area (WRRRA) currently includes a total of 473 acres of harvest. All new harvest acres and cumulatively acres harvested is shown. Alternatives 1 and 5 do not add any new harvest acres within the WRRRA. In order to remain roadless, less than 20% of the 71,387 acre WRRRA can have harvest implemented within the last 10 years or 14,277 acres, and still qualify for roadless. None of the alternatives would approach this magnitude or prevent a future roadless designation based on cumulative acres of harvest. Alternatives 2, 3 and 4 at 937 acres cumulatively would increase the total to 1.5 percent (See wilderness/roadless discussion in section 3.9).

** In order to remain roadless, the WRRRA must have less than ½ mile of improved roads per 1,000 acres. To reach ½ mile per 1,000 acres, a total of 35.7 miles of improved road would need to be present in the WRRRA. Alternatives 2 and 3 add 0.1 miles of new road and Alternative 4 adds 0.05 miles of new road to the WRRRA. Alternatives 1 and 5 do not add road to the WRRRA. Currently 10.7 miles exist in the WRRRA (a road density of 0.15 miles per 1000 acres). The action alternatives would maintain road densities at 0.15 miles per 1000 acres, well below the threshold for roadless designation.

<> Openings Created with clearcuts generate early successional habitat. Note that shelterwood, group selection, and single tree selection cuts provide for 'regeneration' of desirable tree species but is not considered "early successional" habitat.

^^ Softwood habitat improvement benefits snowshoe hare, deer, moose, several bird species, marten, fisher, and lynx.

Chapter 3 – Affected Environment and Environmental Consequences

Introduction

This document, based on the White Mountain National Forest Plan Final Environmental Impact Statement (FEIS), analyzes effects to physical and social resources. Tiering to that FEIS and Forest Plan, the physical, biological and social direct, indirect, and cumulative effects of the Proposed Action and its alternatives are analyzed in this chapter.

This analysis considers the effects of the project proposal on Recreation; Scenery; Soils; Water Quantity and Water Quality; Fisheries; Roadless/Wilderness; Wildlife Habitat (including a Biological Evaluation with Federal Threatened, Endangered, and Proposed Species (TEPS) and Regional Forester Sensitive Species (RFSS); and Non-Native Invasive Species (NNIS)), Socio-Economic Resources, Air Quality, and Heritage Resources.

Maintaining native biological diversity is a key component of the White Mountain National Forest's Desired Future Condition (DFC) and management goals. The FEIS for the 2005 Land and Resource Management Plan defines biological diversity as the sum of all natural communities, ecological processes, and species. The FEIS further defines biological diversity in northern New England as "broad communities, such as northern hardwood forest, and isolated communities like cedar swamps. It encompasses processes such as nutrient cycling, the decay that creates snags, and natural disturbance. Species of plants and animals, in all their genetic variations, also are a part of biodiversity." The FEIS states that the challenge of maintaining biological diversity is twofold: "determining how best to conserve biological diversity when it includes forest, open, alpine, and aquatic ecosystems; common and rare species, and innumerable ecological processes; and integrating biodiversity needs with meeting the social and economic aspects of sustainable ecosystem management." (USDA-Forest Service, 2005b, FEIS, p 3-3)

Forest Plan goals, standards, and guidelines provide management direction for management of the Forest (USDA-Forest Service, 2005c, WMNF). All goals, standards, and guidelines listed in the 2005 Forest Plan, by definition, apply to the Than Forest Resource Management Project. Design features and mitigation measures highlight how some of the standards and guidelines would be applied in this project. Project mitigation measures add to Forest Plan standards and guidelines, and are included to manage a site-specific situation not addressed in the Forest Plan. These features and mitigations are listed in Appendix A.

Resource issues raised during the scoping process (see Chapter 1) are addressed in this chapter. Design features and mitigations that apply to a resource area, and why they work, are explained where needed to provide better understanding of the mitigation and its effect. Each resource section analyzed in detail is organized as follows.

- Issues Related to the Resource.
- Description of Affected Environment (Existing Condition).
- Analysis of Direct and Indirect Effects on the Resource (By Alternative):
 - o Direct Effects are caused by the action and occur at the same place and time;
 - o Indirect Effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.
- Analysis of Cumulative Effects on the Resource (By Alternative):
 - o Cumulative Effects result from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions, regardless of which government agency or individual undertakes such other actions.

In accordance with the June 24, 2005 Council on Environmental Quality (CEQ) Memorandum entitled “Guidance on the Consideration of Past Actions in Cumulative Effects Analysis” (CEQ June 24, 2005), with 40 CFR 1500-1508, and with the January 1997 CEQ publication “Considering Cumulative Effects Under the National Environmental Policy Act” (CEQ, January 1997), the cumulative effects analysis for each resource area considers a geographic area and a time frame of past, present, and foreseeable future actions “relevant to reasonably foreseeable significant adverse impacts” on that resource, and “essential to a reasoned choice among alternatives.” This consideration does not extend to actions “outside the geographic boundaries or time frame established for the cumulative effects analysis.” (CEQ January 1997)

Recreation

Issues Related to Recreation

- *Temporary closures of Nordic ski trails*
- *View of Mount Washington from the Hall’s Ledge Overlook*
- *New Nordic trail construction*
- *New parking area for summer users*
- *Relocation of Bog Brook hiking Trail*
- *Harvest units’ proximity to trails*

Affected Environment

Recreation resources within and adjacent to the Than Project include trailheads, hiking trails, Nordic ski trails, and roads used for various recreation activities. Effects to the Wildcat Wild and Scenic River and to the inventoried Roadless Area are addressed separately.

Hiking Trails

Three hiking trails lie within the Than Project Area: Halls Ledge Trail, Wildcat River Trail, and the Bog Brook Trail. Several of the proposed harvest units lie immediately on or adjacent to these hiking trails (see Figure 4).

Additionally, the Black Mountain Cabin Trail, Wild River, and the Hutmen’s Trail are nearby the project area. Table 8 describes these trails and their use levels.

Table 8 Description and Use Levels of Hiking Trails in and nearby the Than Project Area

Trail	Use Level During Peak Season*	Description+
Halls Ledge	Low	3.3 mile trail from NH16 to Carter Notch Road providing views of Mt. Washington.
Wildcat River	Low	3.5 mile trail from Bog Brook Trail near Carter Notch Road to Carter Notch Hut.
Wild River	Low	9.6 mile trail from the end of Wild River Rd in Evans Notch to Wildcat River Trail near Perkins Notch Shelter.
Bog Brook	Low	2.8 mile trail from Carter Notch Road to the Wild River Trail.
Black Mtn Cabin	Moderate	1.6 mile trail that leads to Black Mountain Cabin and to a knob with views of Carter Notch and Mt. Washington.
Hutmen’s	Low	3.1 mile trail from NH16 to Carter Notch Road providing views of Carter Notch and Mt. Washington.

*Use level is people per day (ppd) during peak use (e.g. school vacation weeks, holiday weekends). Range of use of levels is: Low = 0-6 ppd; Moderate = 7-25 ppd; High = 26-50 ppd; Very High = 51+ ppd; Data from WMNF Trail Use Levels 2002+ From AMC White Mountain Guide 28th Ed. and Saco Ranger District trails files.

Nordic Ski Trails

Numerous Nordic ski trails lie within or immediately adjacent to the project area. All ski trails are maintained by the Jackson Ski Touring Foundation (JSTF), under a Nordic ski area Special Use Permit. Approximately 41 percent of the 74 mile JSTF trail system is located on National Forest lands (JSTF Special Use Permit). JSTF also maintains trails on private and Town of Jackson lands.

Table 9 provides a brief description, including use levels, of the Nordic ski trails within or immediately adjacent to the Than Project Area. These trails include those with potential to be both directly or indirectly affected by the proposed Than Project. Details are described by alternative in the Direct and Indirect Effects and Cumulative Effects sections following.

**Table 9 Description and Use Levels of Nordic Ski Trail
in Than Project Area**

Trail	Use Level During Peak Season*	Description+
Halls Ledge Overlook	Low	0.2 mile (.3 km) trail that provides views of Mt. Washington
Boggy Brook	High	2.2 mile (3.5 km) trail that lies on FR 233
Marsh Brook	Low	1.4 mile (2.3 km) trail that connects the Wildcat Valley (Carter Notch Rd) to the Dana Place Trail.
Dana Place	Moderate**	4.4 mile (2.7 km) trail that connects FR 512 and NH 16
UST	Moderate**	.4 mile (.7 km) trail on east side that provides an easy ski to a scenic vista; this trail lies on NFSR 512
Quail Trail	Moderate**	.5 mile (.8 km) trail that provides an easier connection to the UST than the Dana Place Trail
Wildcat Valley	Moderate	11 mile (17.8 km) trail that connects Carter Notch Road to the summit of Wildcat, using a portion of Carter Notch Road as a groomed trail

*Use level is people per day (ppd) during peak use (e.g. school vacation weeks, holiday weekends). Range of use of levels is: Low = 0-6 ppd; Moderate = 7-25 ppd; High = 26-50 ppd; Very High = 51+ ppd; Data from WMNF Trail Use Levels and personal communication with Joe Gill, JSTF Permit Administrator**Trail is used more frequently early and late ski season when there is little to no skiing elsewhere on the system. Trails often experience high use during low snow periods and low use during peak snow season, resulting in a moderate use level.+ From JSTF Ski Trail System Map and AMC White Mountain Guide 28th Ed.

Other Recreation Components

The ski trails described above are also used by hikers, hunters, anglers, and others during the spring, summer, and fall. However, the use level is much lower when snow adequate for skiing is not present. In addition, Forest Road (FR) 233 and FR 512 are used by local citizens for walking. Mountain bikers also use the roads and trails *where allowed*. The existing Trailhead parking for Bog Brook Trail is on private land and is in poor condition. For this reason, trailhead relocation near the beginning of NFSR 233 is proposed. Relocating about 750 of the Bog Brook Trail to connect to the new trailhead parking would be needed. The intensity of use at these locations is generally low (0-6 people per day in any one location).

Direct and Indirect Effects on Recreation

The Analysis Area for direct and indirect effects on recreation is defined as the Wildcat River Habitat Management Unit (HMU) and the portion of the Ellis River HMU east of NH Route 16. The time frame is the actual duration of the Than Project, expected to be 2 to 4 years, depending on the alternative selected and on sale operations. This area and duration was selected because where and when the management action ceases, so do the effects.

The recreation setting for this recreation analysis area is described by the Recreation Opportunity Spectrum (ROS). ROS defines a range of unique recreation experiences as Primitive, Semi-Primitive Nonmotorized, Semi-Primitive Motorized, Roaded Natural, and Rural (Forest Plan, 2005, p 1-10 and Map 1-11). The lands within the project area predominantly fall into Management Area (MA) 2.1, General Forest Management. The ROS goal for MA 2.1 is to offer a full mix of ROS objectives. The MA 2.1 lands in the project area are identified as Semi-Primitive Motorized, which is characterized by predominantly natural or natural-appearing environment of moderate to large size. Concentration of users is generally low, but there is often evidence of other users. Motorized use may also be evident.

**Alternative 1:
No Action**

Alternative 1 would neither alter nor enhance current recreation opportunities. This includes not relocating the portions of the Wildcat River Trail or the creation of a parking area to address additional visitor needs at the Bog Brook Trailhead. The additional 2 miles of Nordic ski trail would not be constructed under this alternative. The effect of No Action is that current parking on private land would continue, unless prohibited by the landowner. The effects of not relocating the Wildcat River Trail are hydrologic and are explained in the Water and Fisheries sections. The effects of not harvesting trees to create habitat may limit the numbers or frequency that wildlife are observed within the project area. Nordic skiers would continue to have a single option for skiing the Boggy Brook trail, with no loop opportunity. Since the effects of No Action would be “no-change,” the cumulative effects would be the same.

**Alternative 2:
Proposed Action**

This alternative would have the most short-term direct and indirect effects on the recreation opportunities and experiences in the analysis area. Short-term, timber harvest activity would affect hikers, Nordic skiers, and other users. However, past timber harvest has occurred in the analysis area, and therefore the long-term recreation experience is not expected to change as a result of the vegetation management or other proposed actions. Recreation opportunity improvements are also proposed as part of this alternative.

Hiking Trails

The Black Mountain Cabin and Wild River and Hutmen’s trails would not be directly affected by any of the activities proposed under this alternative. Indirect impacts would primarily include noise associated with logging operations. Foreground views from some portions of some trails, and distant views from certain viewpoints on these trails, would change following harvest (see Scenery section). However, views currently include a mix of vegetation textures and color, tree sizes, and natural openings. The proposed treatments, especially regarding foreground views from trails, would follow this pattern, blending into the landscape within a few years.

Portions of Bog Brook and Hall's Ledge trails lie within or adjacent to thinning or group/single tree selection units 11, 15, 16, and 27. Skidding directly down any of these hiking trails would *not* be permitted. These units include a 50-foot slash treatment zone along the trails. These are fall/winter harvest units which, if harvested in winter, would have fewer impacts on hikers because hiking trail use is very low in this location during winter.

Trails within the Wildcat Scenic River corridor are afforded additional no-treatment buffers due to the 500-foot buffer on these brooks.

The Hall's Ledge Trail intersects a portion of unit 27, the prescription for which is a group selection with intermingled single tree selection. This trail would be buffered with a 50-foot slash removal zone. Trail crossing by skidders would be minimized and would be situated perpendicular to the trail corridor to protect the trail's character. The visual effects along this section of the trail may last for a few seasons, and are not expected last beyond that time period.

The proposed relocation of approximately 500 feet of the Wildcat River Trail to prevent further erosion would move this section of trail to more suitable ground for hiking.

The Bog Brook Trailhead construction project would be located along FR 233, and would serve both visitors to the National Forest and Jackson's Prospect Farm. Enlarged parking for five cars would be placed on a more suitable location near the beginning of NFSR 233 road to better serve the public. Public use of the trailhead parking during non-snow seasons would eliminate the need for use of parking on private land and on the shoulder of the Class 6 portion of Jackson's Carter Notch Road.

Nordic Ski Trails

Existing Trails

The direct and indirect effects of this alternative upon Nordic ski trails are summarized in Table 10.

This alternative would have the greatest direct and indirect effects on existing Nordic ski trails. Use of NFSR 233, NFSR 512, and Carter Notch Road for timber hauling during the snow season would preclude the grooming of these roads as Nordic ski trails. Access to the Nordic ski trail system in the Carter Notch area would be partially compromised for the duration of the proposed project, expected to be approximately three years under this alternative.

However, the more challenging Marsh Brook Trail provides an alternative for skiers to access a portion of the trail system, although it would require a short walk along Carter Notch Road during seasons it was plowed to access NFSR 233 or Prospect Farm. The Dana Place Trail would continue to provide access from the west, along Route 16.

The resulting change in forest appearance or views along the Nordic ski trails, with nearby harvest units would not be dramatically different than current conditions. The majority of the harvest units adjacent to Nordic trails are prescribed for partial harvest, such as thinning and single tree

Table 10: Harvest Units Adjacent to and other direct effects on Nordic Ski Trails

Trail	Adjacent Harvest Units	Season of Harvest	Direct Effects
Halls Ledge Trail and Overlook	25 27	Summer/Fall Fall	Clearcut U-25 is not expected to be seen from the overlook; direct effects from thinning U-27 would be noise and dust during logging and temporary foreground visual effects of skid trails and slash.
Boggy Brook	1 -17	Summer/Fall/ Winter	NFSR 233 would be plowed during winter operations, extending approximately 3 years
Marsh Brook	None	n/a	None
Dana Place	None	n/a	None
UST	23 - 28	Summer/Fall and Winter	Winter closures on NFSR 512, for winter harvest units under this Alternative.
Quail Trail	None Adjacent Haul Road is NFSR 512	Summer/Fall and Winter	Same as UST, but NFSR 512 once reconstructed, would then be available for non-winter access, and for early/late season grooming.
Wildcat Valley	19	Fall/Winter	Plowing of southern portion (1/2 mile) that lies on Carter Notch Road for approximately 3 years.

selection. Several previous timber sales have occurred in this area in the past, and the current forest landscape is varied, including evidence of even- and uneven-aged vegetation management. Slash from cutting trees would be removed from a 50-foot buffer along the trails to mitigate adverse visual impacts. The visual impacts from partial harvesting in the both the short- and long-term would be minimal to undetectable, depending on the user and residual stand.

Nordic trails that lie on road corridors may benefit, due to drainage improvements that are necessary for timber hauling. These improvements would reduce the need and cost of long-term trail maintenance and can remain following timber harvesting operations.

All Recreation Uses

Throughout the year, the analysis area is used for walking, hiking, Nordic skiing, and mountain biking. Traffic control signs would be installed to alert foot and vehicle traffic to logging operations. The road and trails would remain open to foot travel. Noise associated with harvest activity may be apparent to visitors within one or two miles of logging operations.

Dual use of Carter Notch Road is a concern during the snow-free season when both truck traffic and the public would be sharing the same narrow corridor. Signs would be installed to notify the public of truck traffic. Hauling would not be allowed on weekends and federal holidays.

The analysis area is also used by hunters. Since this alternative would establish the most early-successional forest stands, future habitat and browse for certain game species would increase. Lastly, the removal of the dilapidated structures near the Bog Brook Trailhead would eliminate a safety hazard as well as return the area to a more natural-appearing condition.

Alternative 3

This alternative would have less short-term direct and indirect effects on winter recreation than Alternative 2. However, the duration of activity would likely increase by 1 to 2 years under this alternative because the season of harvest would be restricted to summer and fall for a portion of the project area (up to December 15th each year). Therefore, recreation during the snow-free season would be affected to a greater degree under this alternative. The long-term recreation experience is not expected to change as a result of the vegetation management activities proposed in this alternative because timber harvest has occurred in the analysis area numerous times in the past.

Hiking Trails

The effects of this alternative on hiking trails are nearly identical to Alternative 2. The only exception is that, due to seasonal restrictions on harvesting activity, the duration of this project would increase by approximately 1 to 2 years. Exposure to noise and truck traffic would remain for a longer period of time.

The relocation of the Bog Brook Trailhead and Trail and the relocation of the Wildcat Brook Trail are included in this alternative.

Nordic Ski Trails

Existing Trails

By limiting logging operations from summer through December 15th for those units accessed from NFSR 512, the effects of this alternative on Nordic ski trails would be much less than Alternative 2, and somewhat less than alternative 4. In Alternative 3, closures of ski trails would not be necessary. If significant snow accumulated prior to December 15th, then the effect of this alternative would increase as the roads that also serve as Nordic ski trails may be plowed, potentially removing this early snow base.

The resulting change in forest appearance would be nearly identical to Alternative 2, as would improvements to drainage structures on those trails that lie on Forest roads.

Proposed Trails

This alternative also proposes a new Nordic ski trail connecting the Boggy Brook Trail (FR 233) to the East Pasture Trail. This proposed trail is approximately 2 miles in length and is part of JSTF's Special Use Permit master development plan. This trail would provide an additional loop opportunity for Nordic skiers connecting the Carter Notch and East Pasture areas. During the snow-free season, this trail would also likely be used by

hikers and other visitors. It would also provide an additional route and access point for Black Mountain Cabin.

All Recreation Uses

The audible, visual, and traffic impacts to other recreation uses such as mountain biking and hunting would be similar to Alternative 2, but would likely last for a longer period of time due to a shortened operating season for logging operations. Traffic control signs would be installed to alert foot and vehicle traffic to logging operations.

Alternative 4

This alternative would have fewer short-term direct and indirect effects on recreation than Alternative 2, and would have different effects than Alternative 3. Under Alternative 4, the season of harvest is limited to summer and fall for those units accessed from FR 512, except for units 28 and 37 where frozen ground conditions are preferred. The long-term recreation experience is not expected to change as a result of the vegetation management activities proposed in this alternative. Timber harvest has occurred in the analysis area numerous times in the past.

Hiking Trails

The effects of this alternative on hiking trails are very similar to Alternative 2. This alternative therefore has similar impact on hiking trails in the project area as Alternative 2 and 3. The project length would at most be increased by one season to accommodate the season of harvest restrictions for units accessed from FR 512.

Nordic Ski Trails

Existing Trails

Alternative 4 would have fewer effects on existing Nordic trails than Alternative 2, but greater effects than Alternative 3 associated with NFSR 512. Alternative 4 limits winter harvest for the majority of units that would be hauled on NFSR 512, however, it allows for an exception for units 28 and 37. The plowing and closure of NFSR 512 during the snow season, therefore, would likely encompass one winter season rather than multiple years as proposed under Alternative 2. Additionally, this alternative reduces the size of unit 25, a proposed clearcut, from 29 to 23 acres. This unit was of particular concern due to the view of Mt. Washington skiers appreciate at the terminus of the Hall's Ledge Overlook. The remainder of the project area would have similar effects to Nordic skiing as Alternative 2.

Proposed Trails

Under this alternative, a new Nordic trail is proposed as in Alternative 3, connecting the Boggy Brook and East Pasture trails. The associated effects are the same as in Alternative 3.

All Recreation Uses

The direct and indirect effects on all recreation uses are very similar to those identified for Alternative 2. However, this alternative proposes a

greater amount of regeneration harvest, creating the most habitat and browse for certain game species.

Alternative 5

Alternative 5 would have the least direct and indirect effects on recreation of all the alternatives other than the No Action alternative. All harvest units within the Wild River Inventoried Roadless Area are deferred under this alternative, which significantly reduces the scale of the project and, therefore, all potential effects to recreation.

Hiking Trails

The only hiking trail directly impacted by timber harvesting activity would be the Hall's Ledge Trail, and the effects to this trail would be identical to those described in Alternative 2. Unit 11 is nearby the Bog Brook Trail, however due to the thick vegetation and buffering of the unit, the impacts to hikers would be limited to noise and truck traffic. Impacts to views from the Black Mountain and Hall's Ledge trails would also be greatly minimized under this alternative, due to the reduction in scale of the project.

The trail enhancements, including the two relocations and parking lot construction, would be identical to Alternatives 2, 3, and 4.

Nordic Ski Trails

The effects to Nordic ski trails would be similar to Alternative 2, although the duration of impacts would be reduced to 1 or 2 seasons. No new Nordic ski trails are proposed under this alternative.

Summary of Direct & Indirect Effects on Recreation

Table 11 summarizes the direction and indirect effects of all alternatives on recreation in the project area.

Table 11: Summary of Direct & Indirect Effects on Recreation

Alternative	Summary of Direct & Indirect Effects
1	<ul style="list-style-type: none"> • Would not alter current recreation opportunities; • No additional Nordic ski trails, no trail relocations or parking parking improvements.
2	<ul style="list-style-type: none"> • Relocation of 500 feet of the Wildcat River Trail where erosion is occurring; • Move Bog Brook Trailhead to a location along NFSR 233 to provide parking opportunities for users of Prospect Farm and NF land and provide about 750 feet of connecting trail to the Bog Brook Trail; • Temporary interruption of access to Quail, UST, Boggy Brook and Wildcat Valley Nordic ski trails for 2 to 3 seasons; • Increased noise and traffic associated with harvesting; • Short term changes to forest landscape along some roads and trails; • Improved opening habitat, and browse for some game species.
3	<ul style="list-style-type: none"> • Less impact to Nordic ski trails than Alternative 2 by limiting the season of harvest to December 15 each year for those units accessed off of NFSR 512; • Possibly add up to 2 miles of new Nordic ski trail connecting Boggy Brook Trail to East Pasture Trail, improving loop skiing opportunities; <p>Other effects on recreation similar to Alternative 2 except:</p> <ul style="list-style-type: none"> • Increased noise and traffic associated with harvesting similar to Alternative 2 but may last an additional 1 to 2 years due to limited season of harvest. • Increased opening habitat and browse for some game species.
4	<ul style="list-style-type: none"> • Less impact to Nordic ski trails than Alternative 2 by allowing for only summer and/or fall harvest in all but two units off of NFSR 512 <p>Other effects on recreation similar to Alternative 2 except:</p> <ul style="list-style-type: none"> • Greater regeneration harvest resulting in more early successional openings and additional browse for certain game species.
5	<ul style="list-style-type: none"> • Less effects to recreation than any of the other action alternatives due to the reduced scope and duration of the project. • Effects to hiking trails is minimal due to reduced number of harvest units. • Effects to Nordic skiing similar to Alternative 2, except the duration limited to 1 or 2 winter seasons. • Less regeneration harvest reduces the number of new openings and the amount of browse for certain game species.

Cumulative Effects on Recreation

The Analysis Area for cumulative effects on recreation includes the Wildcat HMU and the Ellis River HMU. The time frame is the present, including ongoing activities (such as Popple Project) and the foreseeable future (10 years). The Cumulative Effects on Recreation are summarized in Table 12.

Table 12: Summary of Cumulative Effects on Nordic Ski Trails

Alternative	Potential Cumulative Effects
1	None
2	<ul style="list-style-type: none"> • Potential concurrent winter-long closures on Quail, UST, Boggy Brook, and portions of the Hall and Wildcat Valley Trails for 1 or 2 seasons. • Possible continued winter-long closures on Wildcat Valley and Boggy Brook Trails for an additional 2 seasons.
3	<ul style="list-style-type: none"> • Potential concurrent winter-long closures on Boggy Brook, Wildcat Valley and a portion of the Hall Trail for 1 or 2 seasons. • Possible continued winter-long closures on Boggy Brook and Wildcat Valley Trails for an additional 2 seasons.
4	<ul style="list-style-type: none"> • Potential concurrent winter-long closure on Quail, UST, Boggy Brook, and portions of the Hall and Wildcat Valley Trails for 1 season. • Continued winter-long closure on Boggy Brook and a portion of the Wildcat Valley Trails for an additional 1 to 2 seasons.
5	<ul style="list-style-type: none"> • Potential concurrent winter-long closures on Quail, UST, Boggy Brook, and portions of the Hall and Wildcat Valley Trails for 1 or 2 seasons.

None of the action alternatives considered in detail would change the long-term recreation opportunities described in the Forest Plan (2005) for the analysis area for cumulative effects on recreation. Recreation and vegetation management activities have co-existed in this area previously, as evidenced by the use of landings and clearcuts as scenic vistas and the use of roads constructed for timber removal as Nordic ski trails. Short-term effects from noise and traffic associated with all activities from both Popple Project and Than Project would end once these projects are completed. See the Scenery section for effects to scenery.

The long-term changes to recreation include a new Nordic ski trail (Alternatives 3 and 4), relocation of portions of the Bog Brook and Wildcat River trails, and relocation of the Bog Brook Trailhead. None of these new recreation opportunities would conflict with the ROS class identified in the Forest Plan for the analysis area.

Cumulative effects on Nordic ski trails from Popple and Than Projects are possible, but *no new vegetation projects* are planned in the foreseeable future within the cumulative effects area.

JSTF maintains an approximately 74-mile trail system, of which approximately 40 miles (41 percent) is located on National Forest lands

(JSTF Special Use Permit). The remainder of the trail system is located on Town of Jackson and private lands.

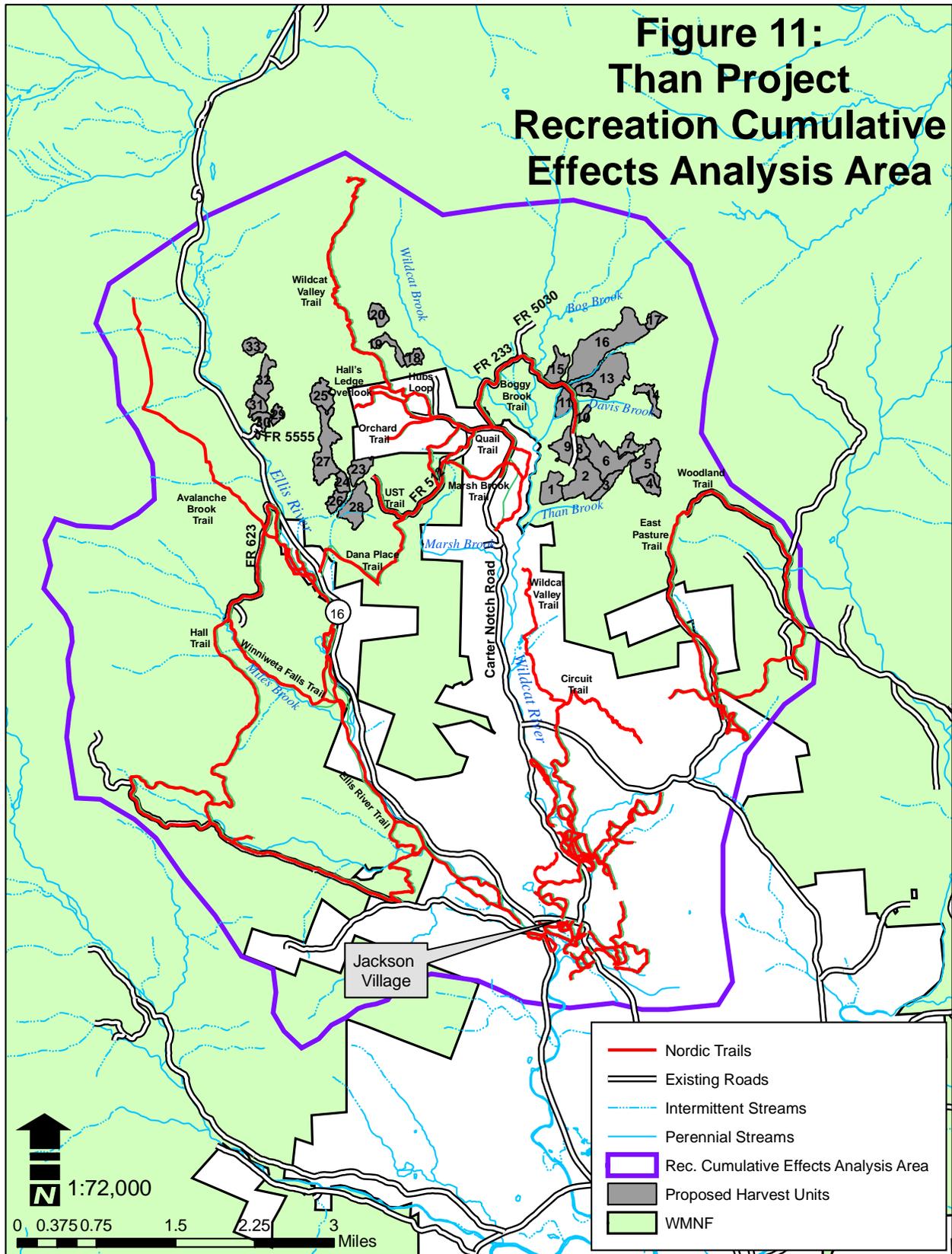
Nordic trails, in addition to those identified in Tables 9 and 10, may be affected simultaneously by the Popple Vegetation Management Project. The Popple Project included two harvest units along NFSR 512; however, harvest season limitations restricted operations to summer and fall up to December 15th. Therefore, these units should not cumulatively impact Nordic skiing.

The Popple Project was divided into North and South timber sales. A portion of North Popple sale was completed in the winter of 2006 which impacted the northern portion of the Hall Trail. This northern portion of the Hall Trail is also expected to be plowed next winter. South Popple sale is limited by season of harvest to December 15th, reducing or eliminating effects to Nordic ski trails (Maple Mountain Loop, Ellis River, and the southern portion of the Hall Trail).

Cumulatively, Alternative 2 would have the greatest effect on Nordic skiing, as that alternative does not propose season of harvest restrictions. Alternative 5 is similar, but with a shorter duration because fewer acres are treated. Alternatives 2, 3, and 4 would have fairly similar cumulative effects, with one additional season of closures along the northern Hall Trail, and up to possibly three seasons closure on Boggy Brook, and the lower half-mile of Wildcat Valley Trail. Under Alternatives 2 and 4, possibly one season closure on the Quail Trail.

Cumulative effects on hiking would be very low because hiking trails remain open to foot travel during harvesting operations. The number of trails affected cumulatively is very small compared to the number of hiking opportunities available in the cumulative effects analysis area. In addition, harvest activities would likely occur in one general area at a time, leaving other nearby trails unaffected. Cumulative effects to biking, hunting, fishing, and other recreation opportunities are not anticipated, even with Popple and Than Projects co-occurring, because neither project has measurable direct or indirect effects on these other recreational activities. No new projects are planned in the foreseeable future within the cumulative effects analysis area, so there would be none that would have an effect on recreation resources.

**Figure 11:
Than Project
Recreation Cumulative
Effects Analysis Area**



Scenery

Issue:

- *Effect of harvest openings on scenery as viewed from Carter Notch, Hall's Ledge, Black Mountain; Black Mountain Cabin, Attitash/Bear Peak, Wildcat Peak, Mount Washington and Iron Mountain.*

Affected Environment

The analysis area for direct and indirect effects is the project area. The viewpoints analyzed are outside the project area, but look into it. The analysis area has moderate terrain with rounded hills and ridges, the dominant Carter Notch and Dome, and river valleys with moderate relief. Geologic and vegetation features are common. Vegetation textures are a mosaic pattern stemming from underlying geology and historical and more recent timber harvesting. Use within the project area is light, except in winter along Nordic trails. The Appalachian National Scenic Trail borders the HMU along Carter Dome, Carter Notch, and Wildcat Peak, but the only known viewpoint into the affected area is from Wildcat Peak, off the balcony of a Ski Area facility that affords a view above the immediate foreground tree line.

Evidence of past management activities are present, including several former openings that now have young trees 15 to 20 feet tall and are approaching twenty or more years of age. Older former cuts within the HMU appear as lighter green patches and blend with existing landscape patterns. Past thinning and single tree selection harvests are not seen because textural changes in the canopy are not apparent.

Seen area differs from different vantage points due to the angle of repose and aspect of viewed landscape. Views of the proposed units are often blocked by dense vegetation, such as at Halls Ledge. Visibility of harvest units from peaks is primarily a concern when involving views of clearcuts. Viewed openings are reduced from their true size due to the edge effect of adjacent vegetation, topography, and aspect, and because of reserve patches placed in key areas.

Field observations and photos were taken from these viewpoints during 2004 and 2005. Halls Ledge has a strong vegetation (spruce trees) barrier that blocks views of units 25, 29, and 33.

Views from Mount Washington of the seen area range from over 4 to nearly 8 miles. Seen area from Wildcat Peak and the Appalachian Trail are from three to four miles, except Unit 20, which is a clearcut in Alternative 4 only, and lies 1.5 miles distant.

Neither Carter Notch Hut nor the "ramparts" above the Hut have a view of the units.

Clearcut units seen from Bear Peak and Little Attitash Mountain would be 10 to 11 miles distant, and views from Iron Mountain would be 5 to 6 miles distant. In both cases, the appearance of the openings would diminish with distance.

Direct and Indirect Effect on Scenery under Alternatives 2, 3, 4, and 5

Thinning and single tree selection treatments would result in naturally appearing stands that would regain foliar density within a few years as tree limbs and forest floor vegetation grow. Table 13, therefore, concentrates on clearcuts.

Reserve patches would be placed to minimize opening size seen from key viewpoints. Clearcuts would receive reserve patches equal to 5 percent of their acreage to meet Forest Plan wildlife habitat guidelines.

Table 13 shows the summed acres of new openings “seen” under each alternative from each viewpoint. The column “Acres Seen Cumulatively” includes past actions that remain in an opening status.

Table 13 Seen Acres in New Individual Openings by Alternative and Cumulatively

Viewpoint	Alt 1 Acres	Alts 2 and 3 Acres Seen	Alt 4 Acres Seen	Alt 5 Acres Seen	Max Acres Seen Cumulatively under any Alt. @	Avg Distance Seen	% of Viewshed
Black Mountain	0	9 acres	22 acres	9 acres	22 acres	0.6 mi	0.44 %
Black Mtn Cabin	0	5 acres	16 acres	5 acres	16 acres	0.5 mi	0.32 %
Attitash/Bear Pk	0	10 acres	20 acres	5 acres	54 acres	10.3 mi	0.38 %
Wildcat Peak	0	33 acres	60 acres	20 acres	94 acres	3.4 mi	0.7 %
Mt. Washington	0	48 acres	56 acres	10 acres	90 acres	6.25 mi	0.75 %
Iron Mountain	0	54 acres	67 acres	15 acres	193 acres	6.1 mi	1.0 %

@ Cumulative acres include recent clearcut openings from the recent Popple Mountain Project; and older less distinct openings created within the last 20 years from Marsh Brook and from Miles Brook and Miles Brook II sales. Black Mountain and Black Mountain Cabin viewpoints do not cumulate additional viewed acres because they do not observe the other Project Areas.

Clearcut openings are unlikely to be visible from Carter Notch or from Halls Ledge. Clearcut units seen from Bear Peak/Attitash at 10 to 11 miles distant, and views from Iron Mountain and Mount Washington at 5 to 6 miles distant, are likely to appear small and be noticed for just the first few years until foliage from new regeneration returns. At these distances, seen openings would appear as semi-natural openings on the landscape within a few years, and following that would be nearly unnoticeable.

The total acres in opening status from any of the viewpoints is within Forest Plan standards of less than 3 percent of the viewed area.

Cumulative Effects on Scenery

Cumulative effects considers effects of past, present, and foreseeable activities across a larger area, including adjacent private lands. **The analysis area for cumulative effects is the viewshed, or seen area from the identified viewpoints, within the Wildcat River and Ellis River drainages. It includes the past harvest areas within these drainages, as shown on Figure 13.**

Existing openings within the cumulative effects area are those resulting from the Popple Project, Popple Mountain Sale (1985), Marsh Brook (1991), Miles Brook (1987), Miles Brook II (1994), Ellis River Sale (1974), and the previous Wildcat Sales (1982 & 1984). Clearcut harvest units from these sales that are approaching 20 years old do not appear as openings from a scenic point of view. See Figure 13 for a detailed map of these past projects.

Changes in texture throughout the viewshed are a result of natural features, variety in vegetation types, rock outcrops, and from aspect. Past management actions within most of the viewshed occurred thirty to fifty years ago, especially within the Wildcat River drainage. To a large degree, the proposed openings within Wildcat River drainage would be the only openings observable. Older openings are now marginally evident, appearing as texture changes only, and blend well with the existing landscape. Cumulatively, the effect on scenery as texture changes occur, as new openings are created and then regenerate, and as tree crowns grow, is that of a dynamic landscape where vegetation changes blend with the landscape. Project design, and the ability of openings to grow thick new forests, quickly insures that any of the action alternatives would meet Forest Plan scenery objectives, individually and cumulatively.

Photo shows example of hardwood tops in skid road during winter logging. Tops reduce soil compaction and rutting when ground is not frozen.



Soils

Issues Related to Soils

- *Impacts to natural communities, primarily soil erosion and soil productivity*

Affected Environment for Soil Erosion and Compaction

The Analysis Area for direct and indirect effects on soil erosion and compaction includes the stands proposed for treatment as part of the Than Forest Resource Management Project. The temporal scope for cumulative effects on soil erosion and compaction is three years, for reasons discussed under Soil Compaction below. Under Alternatives 2, 3, and 4, this project's analysis area totals 929 acres. The stand area is 462 acres under Alternative 5. The project analysis areas lie within the Wildcat River Habitat Management Unit (HMU) and the eastern half of the Ellis River HMU. Part of analyzing the direct and indirect effects on soil erosion and compaction is considering how the soils have responded to effects of past similar actions.

The analysis area has soils common to the White Mountain National Forest, where soils are moderate to well drained fine sandy loam or sandy loam. The stand area is too low on the landscape and gentle in slope to have dry debris slides that would lead to mass movement of shallow gravelly soils. It is low enough on the landscape to have deep soil slumps; however, field review indicates this soil hazard does not exist here (Colter 2006). Therefore, soil erosion and compaction are the potential physical hazards resulting from the Proposed Action.

The stand area is a mix of northern hardwood and softwood Ecological Land Types (ELTs). Ecological Land Typing is useful for making decisions about which method of harvesting to use (even- or uneven-aged management) and in what seasons harvesting can occur to minimize soil disturbance. Table 14 lists the ELTs represented in the stand area. Where clearcutting has occurred, regenerated stands clearly show adequate stocking.

Effects are analyzed in terms of Forest Service Soil Quality Standards (USDA-Forest Service Handbook, Supplement R9RO 2509.18-2005-1). The standards define thresholds for soil characteristics that are used as indicators of detrimental soil disturbance.

Soil Erosion

Surface soil erosion is typically a concern related to roads and skid trails. The soils in the stand area are rated as having a high surface soil erosion hazard relative to other soils on the White Mountain National Forest (USDA-Forest Service, 1986a). This rating is for conditions without forest cover or any mitigation measures. However, the 2005 FEIS notes that "research findings and on-the-ground experience for all [soil] hazard classes confirm that accelerated soil erosion due to roads and skid trails can be reduced — and its effects on streams largely eliminated — by timely application of well-known best management practices." (USDA-Forest Service, 2005b, FEIS, p 3-29) The State of Maine recently published monitoring data that

Table 14. Ecological Land Type (ELT) by Forest Stand

Stands	ELT	Description
All of 1, 8, 18, 19, 20; and portions of 2, 7, 9, 10, 14, 17, 26, 28, 37, and 38	115G	The climax species for this ELT is sugar maple and beech and red maple and yellow paper birch as sub climax species. It is usually found on broad basin-like areas on lower mountain slopes. The soil type is moderately drained, fine sandy loam. Surface soil erosion is high. These soils are moderately suitable for summer operations.
All of 3, 11, 12, 13, 15, 16; and portions of 2, 9, 10, and 38	115a	The climax species for this ELT is fir, spruce & hemlock with a sub climax species of yellow birch, red maple & paper birch. It is usually found lower slopes and intervals at lower elevations with slopes less than 45%. The soil type is moderately well drained, and is a fine sandy loam. Surface soil erosion is high. These soils have moderate to low suitability for summer operations.
Portions of 4, 5, and 14	15J	The climax species for this ELT is a red spruce and balsam fir with a sub climax species of yellow birch sugar maple, and paper birch. It is usually found on mountain slopes. The soil type is moderately well drained and is a very fine sandy loam. Surface soil erosion is moderate. This soil has a moderate suitability for summer operations.
All of 7, 23, 24, 25, 27, 29, and 34; and portions of 5, 6, 26, 28, 30, 31 32, 33, and 37	105	The climax species for this ELT is beech and sugar maple with sub climax species of yellow birch, paper birch and red maple. It is found on lower mountain slopes and intervals. Surface soil erosion is moderate. The soil type is deep till, moderately drained, sandy loams, with low suitability for summer operations.
Portions of 4	2D	This ELT is a red spruce and balsam fir with a sub climax species of paper birch. It is a moderately deep soil on softwood ledge. The soil type is fine sandy loam. Surface soil erosion is high and is well drained. This soil has low suitability for summer operations.
Portions of 30 and 31	11	The climax species is spruce and fir with a sub climax species of red maple and white pine. It is an outwash soil. The soil type is well drained loamy sand with high suitability for summer operations
Portions of 32 and 33	6D	The climax species for this ELT is a red spruce and balsam fir with a sub climax species of yellow birch and paper birch. It is usually found on valley walls and floors and mountain slopes. The soil type is very well drained and is a fine sandy loam. Surface soil erosion is moderate. This soil has a moderate suitability for summer operations

supports the conclusion that properly applied Best Management Practices would mitigate effects from soil erosion (Maine Department of Conservation, Maine Forest Service, 2005; Maine Forestry Best Management Practices Use and Effectiveness 2001-2003) and while the results of a similar study in New Hampshire have not yet been published, Maine and New Hampshire BMPs are similar. It is therefore assumed that the effectiveness of these BMPs are also similar.

Roads and skid trails are a concern for soil erosion because they may expose mineral soil (Patric 1976). The act of cutting trees is not a source of soil erosion because it does not expose mineral soil (Stone et al. 1978). Classified, all-season roads in the stand area are maintained to Forest Service standards that help prevent concentration of water on the road surface. BMPs would be followed to minimize erosion on skid trails during and after harvest operations. Also, slash from delimiting trees at the log landings would be spread on skid trails to reduce potential for erosion (and compaction) (see Appendix A, Mitigation).

Previously used temporary roads and landings have stabilized, and several are revegetated. Waterbars are in place on skid trails, and there is no evidence of accelerated soil erosion on them (Colter 2006).

A short section of the Wildcat River Trail is located in the floodplain of the Wildcat River. Field review has indicated that when the Wildcat River accesses its floodplain during high flow events, water is concentrated on the Wildcat River Trail, eroding the trail surface and increasing sediment supply to the Wildcat River (see the Water Resources section).

Soil Compaction

While improper harvesting operations could reduce forest productivity of subsequent timber stands by compacting soils to the extent that germination and root growth are inhibited, or by creating nutrient deficiencies, aside from skid roads, compaction is seldom a concern on properly conducted logging operations (Hornbeck and Leak 1992). Although more intensive mechanized harvesting systems can cause soil disturbance over more of a harvest unit (Martin 1988), the timber sale administrator will monitor mechanized systems for evidence of increased compaction and take measures to mitigate this effect if it appears likely to occur (see Appendix A).

Soil compaction can also become more of a concern if skid trails are used when wet. BMPs recommend planning harvest operations during appropriate soil and weather conditions. Slash from delimiting trees at the log landings would also be spread on skid trails to reduce potential for compaction (and erosion) (see Appendix A, Mitigation).

Research shows that immediately following winter harvesting, increases in bulk density occur in the upper 8 cm of soil on skid trails, but these were not significant differences from control values 3 years following logging (Donnelly et al. 1991). Holman et al. (1978), working in areas near a spruce-fir site in Maine, concluded that the top 3 inches of mineral soil were compacted to a greater degree than the 3-6 inch depth. They also concluded that compacted soils can be restored to their original bulk

density by freezing and thawing, wetting and drying, root penetration, and animal activity. They found that in non-skid trail areas of the harvest area, bulk density returned to pre-cut levels within one year. Bulk density of skid trails in winter harvest areas returned to normal after two winters. Field investigation of some of the trails confirmed these results in the analysis area, as none of the main skid trails exhibited residual effects of compaction from harvesting activity in the 1996 Marsh Brook Sale, the last time some of these trails were used (Colter 2006).

Existing log landings from previous sale activity are well located and stabilized, and field inspection found no signs of soil erosion or effects from soil compaction as a result of the last harvest activity in 1996 (Colter 2006). Landings are not considered a significant source of soil erosion (Stone et al. 1978), but may sometimes present concerns about soil compaction. However, research reveals that bulk density of soil returns to pre-harvest levels 2-3 years after harvest (Donnelly et al. 1991).

Birch and ash seedlings, where present, are limited by canopy conditions. Soil scarification during non-frozen soil conditions may aid the germination and establishment of these species and the stands' eventual recovery to a diverse species mix. Stand health and resistance to insects and disease is increased with species diversity, and over time provides a safety net against future catastrophic biotic events. To achieve this objective, harvest operating seasons should allow for some soil scarification.

Soil Quality Standards for the Eastern Region of the Forest Service require that soil disturbance (exposure of mineral soil) should be limited to no more than 15 percent of a stand area (USDA-Forest Service Handbook, Supplement R9RO 2509.18-2005-1, Section 2.2).

Photo shows a skid trail leading to the landing below in a thinning unit, Stony Brook Timber Sale, spring 2004. The landing is about ½ acre and the residual trees are at a density of 80 -100 sq. ft. per acre. This stand will continue to provide wildlife habitat and valuable timber into the future.



Direct & Indirect Effects on Soil Erosion and Compaction

Table 15. Ground Disturbance, by Alternative

Activity	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Landings (acres)	0	7	7	7	3
Roads Construction (miles/acres)*	0/0	0.1/0.2	0.1/0.2	0.1/0.2	0
Road Maintenance (miles/acres)	0/0	3.0/7.2	3.0/7.2	3.0/7.2	3.0/7.2
Road Reconstruction (miles/acres)	0/0	2.8/6.7	2.8/6.7	2.8/6.7	2.2/5.3
Skid Trails (miles/acres)	0/0	23.6/57	23.6/57	23.6/57	8.4/20
Nordic Ski Trail Construction (miles/acres)	0/0	0/0	2.3/5.5	2.3/5.5	0/0
Wildcat River Trail Relocation (miles/acres)**	0/0	0.1/0.1	0.1/0.1	0.1/0.1	0.1/0.1
Bog Brook Trail Relocation (miles/acres)	0/0	0.1/0.1	0.1/0.1	0.1/0.1	0.1/0.1
Bog Brook Trailhead Parking (acres)	0	0.1	0.1	0.1	0.1
Total Disturbed Acres	0	71.4	76.9	76.9	35.8
Percent of Project Area Disturbed	0%	7.7%	8.3%	8.3%	7.7%
% of total acres allowing summer or fall harvest only	0%	0.8% of 929 ac.	24% of 929 ac.	22% of 929 ac.	1.7% of 462 ac.

*1 mile of road/skid trail/ski trail at an average disturbance width of 20' = 2.4 acres of disturbance/mile

**hiking trail width =5ft

**Alternative 1:
No Action**

The direct effects for Alternative 1 may be occasional point source soil erosion resulting from the lack of road maintenance or road improvement. In the absence of activities such as timber harvest, no increase in surface soil erosion or soil compaction is expected because there is no road construction or reconstruction, or re-established use of existing skid trails and landings. The Wildcat River Trail would continue to be a source of sediment when the Wildcat River accesses its floodplain and water concentrates on the trail.

No indirect effects are expected from this alternative. See the Water Resources section for analysis of indirect effects of sedimentation.

**Action
Alternatives 2-5**

The Action Alternatives propose to relocate approximately 500 ft of the Wildcat River Trail out of the floodplain of the Wildcat River. Proposed work would involve rehabilitating the old trail location by restoring natural drainage patterns, as well as adding large woody material to the trail to slow water on the trail and store sediment. The wood would also serve to

deter hikers from the old trail location and keep them on the new trail. Ground disturbance would not occur at the old trail location. Minimal ground disturbance would occur at the new trail location during trail construction.

The Action Alternatives propose to relocate the Bog Brook trailhead parking area and construct approximately 750 feet of trail to connect the new trailhead to the existing trail. Ground disturbance would initially occur both at the new trailhead parking area and along the new trail as ground is cleared.

Alternatives 3 and 4 propose the addition of approximately 2.0 miles of Nordic ski trail. The ski trail would use existing skid trails when possible to minimize new ground disturbance. Some ground disturbance would occur as a result of clearing this trail.

Approximately 5.8 miles of existing road is proposed for reconstruction or maintenance under Alternatives 2, 3, and 4. Alternative 5 proposes 5.2 miles of existing road for reconstruction or maintenance. Road reconstruction allows for a higher level of use than the road was originally designed for, such as summer and fall use on a road originally designed for winter use only. This action improves drainage and surfacing on the roads. Road maintenance may involve cleaning culverts, blading the road surface, and/or road resurfacing. Although road reconstruction and maintenance may initially cause ground disturbance, improving and maintaining roads for their level of use can prevent future erosion. Research has shown that maintenance, such as resurfacing roads with a layer of gravel, reduces sediment losses (NCASI 2000). Resurfacing and replacing culverts would help maintain the road and prevent future erosion problems (Moll et al. 1997). This is true also for access to log landings.

Alternatives 2 and 3 propose 500 feet of new road construction and Alternative 4 proposes 200 feet of new road construction. The soil type is moderately drained, fine sandy loam with slopes less than 20 percent. There is some soil erosion potential from new construction because mineral soil is exposed, but all road construction would follow Forest Plan standards and guidelines as well as BMPs to minimize the soil erosion potential.

Following use, roads would be rehabilitated to BMP standards, which have proven effective in preventing soil erosion (Maine Forest Service 2002 and 2005; Stafford et al. 1996).

The majority of the activity area is relatively flat, with steep slopes in some locations. The lengths of these slopes are short enough to limit potential for notable soil erosion. The combination of relatively flat terrain with post-harvest measures in accordance with Forest standards and guidelines and BMPs, such as stabilization and waterbars, should prevent soil erosion and promote revegetation (Maine Forest Service 2002 and 2005; Stafford et al. 1996).

Some units would be harvested only in the summer and fall given proper soil conditions (refer to the tables in Chapter 2 for the specific units). Harvesting and skidding on these stands during summer or fall would expose mineral soil, particularly on the main skid trails, and it is likely

there would be site-specific instances of surface soil erosion from loss of organic cover. Planned layout and management of skid trails, using breaks in terrain and avoiding steep slopes in accordance with Forest Plan standards and guidelines (USDA-Forest Service, 2005a, LRMP, p 2-30), and limiting operations to dry conditions (Maine BMPs) would largely minimize or avoid soil erosion. Some temporary compaction is expected on main skid trails, but this would be minimized by mitigation measures (see Appendix A) and soils should fully recover from any compaction within three years of the end of operations (Donnelly et al. 1991).

Some units would be harvested only in the winter or have the option of winter harvesting (refer to the tables in Chapter 2 for the specific units). With frozen soils, proper skid trail location, and careful closeout at the end of operations, minimum surface soil erosion or soil compaction is likely to occur (Maine Forest Service 2002 and 2005; Stafford et al. 1996). Over-snow operations should produce very little compaction, since operations would not have direct contact with mineral soil, and any effects from compaction should disappear by the following winter.

In Alternatives 2, 3, and 4, five existing and two new log landings are proposed. For Alternative 5, three existing log landings are proposed for use during harvest operations. The landings are well placed because of their gentle terrain and well-drained soils. Truck traffic and skidder operation would churn the soil surface and expose mineral soil leading to on-site soil erosion within the boundary of the log yard. However, the combination of careful site selection and management of the log yard during use would limit the magnitude of soil impacts and prevent long-term and off-site soil erosion impacts. At the time of sale closeout, the log landings would be graded and stabilized to prevent erosion before the landings can revegetate, and to accelerate recovery from temporary soil compaction (FSH 2509.22, Section 6.38).

Sedimentation of streams is the most likely indirect effect from road restoration, culvert removal, skidding, stream crossings, stream restoration, and watershed rehabilitation. See the Water Resources section for an analysis of indirect effects of sedimentation.

An indirect effect of soil erosion or compaction is the rate and success of revegetation on skid trails and log landings. Studies in Maine and Vermont found that soil compaction on log landings and skid trails lasts 2-3 years after operations cease (Donnelly et al. 1991; Holman et al. 1978). Restocking surveys and field reviews on the White Mountain National Forest indicate that skid trails and log landings are revegetating rapidly and naturally. Well distributed rainfall, abundant seed sources, and favorable seedbeds all contribute to rapid revegetation. Log landings typically revegetate first to raspberries and other herbaceous species, and then to forest species. Skid trails typically revegetate to forest species because the trails are narrow enough that sunlight is usually limited, so herbaceous plants do not invade on these locations.

The potential effect of timber harvesting on forest productivity is indirect. The Forest Service has a responsibility for the long-term productivity of

the land. Measurement of northern hardwood forest plots since 1931 at the nearby Bartlett Experimental Forest does not indicate statistically distinguishable change in forest productivity due to human impacts, even including the impacts of acid deposition (Nuegenkapien 1998; FEIS 3-13).

All former clearcuts in the vicinity have regenerated following harvest, and would be expected to do the same following this project. Sometimes there is a concern that organic matter may be lost, causing indirect nutrient consequences. However, it has been found that soil organic matter is not lost but rather is re-distributed in the upper mineral layers during harvest (Johnson et al. 1991; Johnson et al. 1997).

Cumulative Effects on Soil Erosion and Compaction

The Analysis Area for Cumulative effects on soil erosion and compaction is the Ellis River and Wildcat River watersheds. The total acreage of the Ellis River watershed from its headwaters to the confluence of Miles Brook is approximately 10,900 acres. The total acreage of the Wildcat River watershed from its headwaters to the confluence with Marsh Brook is approximately 7,800 acres. This scale is not so large that it spatially dilutes the cumulative sum of effects on soil resources, nor is it so small that it fails to identify and consider past use and potential uses on both National Forest and private lands relative to the proposed project.

The temporal scope for cumulative effects on soil erosion and compaction is ten years in the past and ten years beyond the Proposed Action and its alternatives. These periods were chosen to incorporate the last timber harvesting operations on National Forest lands within the analysis area (1996 Marsh Brook Timber Sale), to consider present effects on soil resources resulting from any past soil-disturbing actions, to allow time for the proposed activities to occur and be completed, and to consider any other foreseeable soil disturbing activities. This time frame allows consideration of multiple uses, and provides enough time for the expected recovery of soils from erosion and compaction resulting from timber harvesting, as well as the projected recovery time from future activities.

Although possible, no additional timber harvest is planned on National Forest lands within the Cumulative Effects Analysis Area over the next ten years, and no other projects are anticipated within this area during this time frame that would utilize the skid trails or landings. The Forest classified roads in the Cumulative Effects Analysis Area would continue to be maintained and used for public and administrative access.

Alternative 1: No Action

There will continue to be localized erosion related to on-going maintenance of Forest roads and private roads and driveways, and construction of new roads associated with residential development and timber harvest on private lands. The Wildcat River Trail would continue to be a source of sediment when the Wildcat River accesses its floodplain and water concentrates on the trail.

Action
Alternatives 2-5

Compaction can accumulate on the ground due to repeated activities. However, there is little or no evidence of compaction from previous harvesting activities (1996 Marsh Brook Timber Sale) on National Forest lands (Colter 2006), implying that the soil has effectively recovered from this activity. Use of 2005 LRMP standards and guidelines and BMPs would minimize the hazard and duration of effects due to soil erosion and compaction (USDA-Forest Service, 2005b, FEIS, p 3-29; Maine Forest Service 2002 and 2005; Stafford et al. 1996). By using existing skid trails and landings, activities would occur where the soil has already demonstrated the ability to recover quickly from short-term effects of harvesting, due possibly to location, soil type, or post-harvest treatments.

Use of BMPs during timber harvest on private lands adjacent to the National Forest lands within the analysis area is expected to limit areas of soil disturbance and soil erosion and compaction. Impacts of residential development depend on the amount of clearing, excavation, and landscaping for each site. Given the relatively flat terrain of the Cumulative Effects Analysis Area, the potential for steep, erosive access roads and building lots is less than it might be elsewhere within and adjacent to the National Forest. Landscaping and erosion control measures would determine whether effects of residential development are short-term or long-term.

Land management activities such as harvesting and road and trail construction typically result in site-specific soil erosion that is generally limited to the area of impact. However, since the effects of soil erosion are often of greatest concern in streams and rivers, this analysis of cumulative effects considers cumulative incremental impacts on watersheds. The proposed stream improvement projects may have short-term, adverse effects on soils, causing erosion in some specific areas; however, the long-term results of these projects is to stabilize the stream in locations where it is has braided, and to improve stream pool ratios. Both of these objectives would reduce the long-term potential for stream bank erosion and subsequent downstream adverse effects from sedimentation and stream bed loading.

The Than project would result in a short-term increase in the amount of the analysis area that has disturbed soils. Referring to Table 15, soil disturbance would occur on 71.4 acres, or 7.7 percent of the 929 acre stand area in Alternative 2; soil disturbance would occur on 76.9 acres, or 8.3 percent of the stand area in Alternatives 3 and 4; and for Alternative 5, 35.8 acres would have soil disturbed, or 7.7 percent of the 462 acre stand area.

The amount of private land within the cumulative effects watershed (Ellis River watershed from its headwaters to the confluence of Miles Brook – 10,900 acres, and Wildcat River watershed from its headwaters to the confluence with Marsh Brook – 7,800 acres) is approximately 1,309 acres of private ownership. In a *worst case* scenario, if all of these adjacent private

lands were to receive active forest management or residential landscaping over the cumulative effects ten-year period, this would equate to an average of 130 acres of private land that might experience some level of soil disturbance in a given year.

Impacted soils take three years to recover from erosion and compaction, then the amount of adjacent *private* land experiencing possible effects from soil-disturbing activity may be as much as 520 acres (three years past, plus current year). Assuming an average of 15 percent soil disturbance per acre of private land, then the amount of disturbed soil over this period would be 78 acres per year.

Referencing Table 15 and rounding numbers up, if the Than Forest Resource Management Project were implemented in three years, then the impacted National Forest would be 72 acres (Alternative 2), 77 acres (Alternatives 3 and 4), and 36 acres (Alternative 5).

In addition, other actions within the cumulative affects area include activities for Popple Project under the Popple North and Popple South timber sales. These two projects are in the Ellis River portion of the analysis area. Their total of 1,032 acres could result (at a rate of 15 percent ground disturbance) in an additional 156 acres of soil disturbance.

If Popple and Than timber sales were implemented during the same three year period, combined with possible maximum impacts (78 acres) on private land, the maximum impact would be 156 acres for Popple, plus 78 acres for private, plus 77 acres for Than – for a total of 311 acres affected cumulatively.

The amount of the 18,700-acre Cumulative Effects Analysis Area that might experience soil erosion and compaction over the course of the Than Project is a maximum of 311 acres, or 1.66 percent, soil disturbance over the life of the project using the most impactful alternative, the maximum harvest for Popple Sale (a three year completion), and the worst case scenario on private land.

In summary, the action alternatives would cause some cumulative effects from soil erosion and compaction, but these effects are likely to be site-specific, limited in magnitude and duration, and well within the soil disturbance limits established by the Soil Quality Standards for the Eastern Region of the Forest Service (USDA-Forest Service Handbook, Supplement R9RO 2509.18-2005-1, Section 2.2), as well as the scope of effects anticipated and analyzed in the 2005 FEIS (USDA-Forest Service, 2005b, FEIS, pp 3-29 to 3-36).

Soil Productivity

Issues Related to Soils

- *Impacts to natural communities, primarily soil erosion and soil productivity*

The Forest Service defines soil productivity as “the inherent capacity of the soil to support the growth of specified plants, plant communities or sequences of plant communities.” Soil productivity may be expressed in a

variety of ways, including volume or weight/unit area/year, percent plant cover, or other measures of biomass accumulation (USDA-Forest Service, FSH 2509.18).

The 2005 FEIS identifies a general concern and analyzes in detail the potential impacts of acid deposition and timber harvest on soil productivity, including the cumulative impacts of these factors. The main focus of this analysis is on soil calcium, based on research on watershed studies (Federer, 1989; Likens et al. 1998; Bailey et al. 2003), experimental watershed acidification (Fernandez et al. 2003), and retrospective soil analysis (Lawrence et al. 1997; Bailey et al. 2005). This analysis for the Proposed Action and its alternatives incorporates by reference the soil productivity analysis in the FEIS, and summarizes key points relevant to this project level analysis (USDA-Forest Service, 2005b, FEIS, pp 3-7 to 3-28).

- Estimated loss of soil calcium raises concerns about possible changes in forest health (dieback or decline), productivity, and forest species composition (FEIS, p 3-7).
- Factors affecting soil nutrients (including calcium) and long-term soil productivity include:
 - o Soil physical and chemical characteristics: soils between 1,000 and 2,500 feet in elevation are generally considered acidic with relatively low base saturation; however, recent work is revealing a more complex situation, with a range in the concentration of soil calcium being likely (FEIS, p 3-10).
 - o Land use history: intense early harvest may have removed one to two percent of the total calcium supply in some forest soils; however, areas below 2,500 feet in elevation on the White Mountain National Forest today support a well-stocked and growing forest with an average age of 80 to 85 years old or older (FEIS, p 3-11).
 - o Soil mineralogy: mineral weathering is the major source of long-term soil calcium to support forest growth, and it mitigates the impacts of acid deposition (FEIS, p 3-11).
 - o Atmospheric deposition: acid anions entering the soil via deposition may lead to the displacement of soil calcium and its replacement by aluminum, as well as loss of soil calcium to streams since 1955 research suggests there may be a net loss of soil calcium at some sites; however, research at Hubbard Brook Experimental Forest, using far more intense harvest than is practiced on the White Mountain National Forest, indicates no short-term loss in exchangeable soil calcium fifteen years after whole-tree clearcutting in northern hardwoods (FEIS, pp 3-11, 3-12).
- Despite concern about calcium loss, there is no peer-reviewed evidence demonstrating that acid deposition affects the health or productivity of the northern hardwood forest on the White Mountain National Forest. Long-term biomass accumulation studies in hardwood (and softwood) forest starting in 1931 indicate no

observable change in biomass accumulation trends (FEIS, p 3-13).

- Examination of forest regeneration success at all clearcut and selective cut sites on the White Mountain National Forest since 1986 indicates no instances of failed regeneration. This is particularly significant because restocking is the first step in re-accumulation of biomass, and therefore an important first step to indicating that long-term soil productivity has not been foregone or irreversibly impacts (FEIS, p 3-15).
- Changes in forest species composition may be an indicator of changes in soil nutrients. Current evidence does not indicate that change is occurring in species composition. The available evidence indicates that composition is a successional process based on site, and natural succession has been the dominant factor affecting species trends (FEIS, p 3-16).

In measuring effects, the FEIS states that “estimated losses of soil calcium may be attributed to *acid deposition*, declining contributions of calcium from atmospheric deposition, and forest *harvesting*. Losses are buffered by mineral weathering in the soil and some continuing calcium deposition. Biochemical modeling reveals that atmospheric deposition, especially (sulfate), had the greatest effect on estimated calcium loss, while forest harvesting led to only a slight decrease in exchangeable soil calcium.” (FEIS, p 3-17)

The **direct effect** of timber harvesting is the removal of calcium with forest products. In general, harvest that removes only the bole of a tree, removes only a portion of the calcium in the tree. Tree species vary in amount and distribution of calcium. Sugar maple is one of the most calcium rich, and the tops, limbs, and leaves equal about 35 percent of the calcium in a tree (FEIS, p 3-17). Forest harvest removes calcium that would otherwise be recycled to the forest floor. Whole-tree clearcut harvest removes the most calcium from a site (FEIS, pp 3-18, 3-19, 3-27).

The **indirect effect** of timber harvesting includes possible changes in available (exchangeable) soil calcium, base saturation, and possible impacts on forest health, tree mortality and decay, productivity, or species composition that are attributed to forest harvest (as compared to acid deposition) (FEIS, p 3-18). No impact is expected on forest health or productivity related to the timber harvest program during the next two decades (FEIS, p 3-27).

The **cumulative effects** are the impact of past, present, and foreseeable future actions, which in this case includes consideration of early land use (forestry, agriculture), long-term changes in atmospheric deposition (sulfate, nitrate, particulate matter), and future land uses (FEIS, p 3-18).

No impact on long-term soil productivity ... is expected ... given 1) the available evidence on exchangeable soil calcium impacts from timber harvest; 2) long-term observations about forest productivity; 3) long-term evidence about forest species composition; 4) the absence of inciting factors that affect forest health; 5) no link made on the White Mountain National Forest between forest health and

soil calcium; and 6) the indications that long-term impacts are not irreparable, though it will take time. (FEIS, p 3-26)

The driving force in possible change is atmospheric deposition, due to the fact that the best modeling available indicates that harvesting is a small factor. (FEIS, p 3-27)

The Analysis Area for direct, indirect, and cumulative effects on soil productivity is the location of the actual harvest activities since site-specific impacts related to soil or forest productivity are not likely to extend further. **The temporal scope for cumulative effects on soil productivity** is from harvesting in the early 1900s to ten years into the future, which is the reasonable planning horizon for a future harvest. Early harvesting is considered because land use may affect soil nutrients, including soil calcium (Hornbeck 1990). Future harvest and acid deposition are considered for the same reason.

The Than project has soils common to the White Mountain National Forest. Soils are deep, well and moderately well drained, sandy loam tills on 10 to 30 percent slopes.

For the most part, soils are a mix of well and moderately well drained sandy loam and fine sandy loam tills corresponding to ecological land types 105 and 115g. These are typical soils on suitable lands on the White Mountain National Forest. These land types produce northern hardwood forest with differing mixtures of sugar maple and beech becoming common in the more mature stands. There are a few small areas of spruce-fir on moderately well to poorly drained fine sandy loams, generally found on lower ground with surface drainages being fairly common. This is ecological land type 115a.

Early land use records indicate that the Than area in the early 1900s was lightly culled (meaning a small proportion of trees were removed from the area), including softwoods, and that at its upper reaches there had apparently been forest fires (Goodale 2003). The records do not indicate a history of intense timber harvesting, as is sometimes the case on other parts of the White Mountain National Forest. Early historical records do not exist for all parts of the proposed sale area, but examining the vicinity overall, the records available appear representative.

Since those early times, there have been conventional, bole-only harvests in this vicinity. Bole-only harvest means the tops and limbs of the trees have been left in the forest, which in turn means that about 35 percent of the calcium that could be taken from the forest through harvest has, instead, been left on-site. Field examinations indicate that all stands previously harvested to regenerate new forest have met agency requirements for adequate stocking of years 3 and 5 post-harvest. This is consistent with Forest-wide restocking surveys, which show that all clearcut and selection harvests on a variety of soils, aspects, and topographic positions have regenerated. This is important because restocking is the first step in the re-accumulation of biomass, which is the agency measure used to assure that long-term soil productivity has not been foregone. It is also indicative that the forest response to harvest treatment is consistent with the expectations

of silvicultural guides referenced in the 2005 Forest Plan.

Direct and Indirect Impacts to Soil Productivity

**Alternative 1:
No Action**

The No Action alternative has no direct impact on long term soil productivity or forest health. The indirect impact of no timber harvest includes no possible changes in available (exchangeable) soil calcium, base saturation, and possible impacts on forest health, productivity, or species composition that are attributed to forest harvest (as compared to acid deposition) (FEIS 3-18). Given that acid deposition is the primary mechanism affecting soil acidification, deferring treatment is likely to exert little impact on soil productivity or forest health.

**Action
Alternatives 2-5**

The proposed action and alternative action alternatives are summarized in Tables 16 and 17. The summary is organized by clearcut vs. selection + group + thinning. This distinction is made because the quantity of calcium removed in harvest varies by area and by harvest method. Clearcut, for example, removes about 350 Kg/ha of calcium when bole-only harvest is used, and 539 Kg/ha when whole-tree harvest is proposed. The other methods remove about 25 percent of this, or 88 Kg/ha with bole-only, and 134 Kg/ha when whole-tree harvest is proposed. Proposed harvesting in the Than Project is a mixture of bole-only and whole-tree harvest. The 25 percent for other harvest methods represents the proportion of an area actually harvested; for example, a thinning removes the trees from approximately 25 percent of an acre because about 70 percent of the forest’s basal area is left after the thinning. These estimates of calcium removed in forest products indicate that, in general, clearcuts have a greater potential direct impact on calcium removed, especially if whole-tree harvest is used, as compared to bole-only clearcut harvest or selective or thinning harvests. Thinning and selective harvest have less impact than clearcutting. However, over time, even-age harvests remove the same amount of forest as uneven-age methods, so the cumulative impact is nearly the same, though there are instances uneven-age harvest actually removes more (Adams et al. 1996).

Table 16: Units where Whole Tree Harvest would be allowed.

Alternative	Units with whole-tree harvest of clearcut and Shelterwood	Units with whole-tree harvest of STS/GS/Thinning
2	7, 8, 10, 12, 24, 25, and 33	1, 2, 6, 18, 19, 20, and 23
3	7, 8, 10, 12, 24, 25, and 33	1, 2, 6, 18, 19, 20, and 23
4	7, 8, 10, 12, 20, 24, 25, 33, 34, and 38	1, 2, 6, 18, 19, 23,
5	7, 8, 10, and 24	1, 2, 6, and 23

Table 17: Number of Acres by Each Harvest Practice

Alternative	Acres of clearcut and shelterwood	Acres of whole-tree harvest of clearcut and shelterwood	Acres of units with STS/GS/Thinning	Acres of whole-tree harvest in units with STS/GS/Thinning
2	181	108	748	227
3	181	108	748	227
4	232	148	696	191
5	60	52	307	176

Bole-only clearcut harvest would remove an estimated 2 percent of the calcium from a site, and a whole-tree harvest clearcut would remove about 4 percent when compared to the total calcium that resides in the soil. The other bole-only harvest methods would remove between 1 and <1 percent of the calcium when compared to the total calcium that resides in the soil. While the whole-tree harvest other methods would remove 2 to 1 percent of the calcium when compared to the total calcium that resides in the soil (FEIS 3-19), this suggests 50 percent of the calcium is in the tops and leaves not 35 percent, which is what the scientific literature now suggests. On this basis, Alternative 5 has the least potential impact on calcium, while Alternative 4 has the greatest potential impact. Alternatives 2 and 3 are in between the least and greatest potential impact alternatives.

With respect to indirect impacts, based on actual on-site measurements at Hubbard Brook Experimental Forest — over a period of fifteen years at sixty soil pits — soil exchangeable calcium was not lost due to forest harvest (USDA-Forest Service, 2005b FEIS, p 3-20). There is no peer-reviewed evidence that soil buffering capacity has declined on the White Mountain National Forest. From the perspective of the agency requirements for assessment of soil productivity based on biomass accumulation, as mentioned previously, research evidence does not indicate any change in observable trends in biomass accumulation since the early 1930s (USDA-Forest Service, 2005b FEIS, p 3-13). Assessments based on recent measurements related to forest productivity, as well as on measurements at Hubbard Brook Experimental Forest and elsewhere on or in the vicinity of the White Mountain National Forest, reveal similar results for both hardwoods and softwoods (USDA-Forest Service, 2005b FEIS, p 3-13).

In the short-term, clearcutting removes the greatest amount of calcium at an individual site. Whole-tree skidding in summer or fall is likely to remove a portion of the leaf matter during the process, but this would still be deposited on the forest floor and retained within the stand area. Hornbeck et al. (1990) estimated leaf fall could reduce calcium removal by 10 percent.

With respect to indirect impacts, referring to the 2005 FEIS, research has shown no change in exchangeable soil calcium and soil base saturation, and no change in biomass accumulation, as a result of timber harvest. Research is underway to determine additional sources of calcium (possibly deep rooting reserves or non-exchangeable reserves or calcium oxalate)

not accounted for in existing studies that could be replenishing the exchangeable calcium reserve that is removed in the short-term by timber harvest (USDA-Forest Service, 2005b, FEIS, pp 3-20 to 3-27).

Cumulative Effects on Soil Productivity

Table18: Estimated Calcium Removal Cumulative Effect total loss by Harvest Practice

<u>No Action w/ One Previous Thinning Harvest</u>	<u>No Action w/ One Previous Uneven Age Harvest</u>	<u>Bole-only Clear Cut and One Previous Thinning Harvest</u>	<u>WTH Clear Cut and One Previous Thinning Harvest</u>	<u>Bole-only Thin and One Previous Thinning Harvest</u>	<u>WTH Thin and One Previous Thinning Harvest</u>	<u>Bole-only Uneven Age and One Previous Thinning Harvest</u>	<u>WTH Uneven Age and One Previous Thinning Harvest</u>
2.4% Estimated Ca loss	3.1% Estimated Ca loss	5.6% Estimated Ca loss	7.3% Estimated Ca loss	2.5% Estimated Ca loss	3.7% Estimated Ca loss	3.9% Estimated Ca loss	4.4% Estimated Ca loss

The % total loss takes into account calcium depletion for the last 56 years, calcium depletion for the next 10 years, previous harvests and current harvest proposed.

**Alternative 1:
No Action**

Early land use is estimated to have removed calcium from harvested forest stands (Hornbeck 1990). Within the analysis area, early forest harvest appears to have been relatively light, so it was probably similar to a thinning or selective harvest. Based on soil nutrient depletion tables, this may have removed <1 percent of the calcium per acre of harvest (Fay 2003).

Atmospheric deposition may also remove calcium from the soil irrespective of timber harvest. The most recent small watershed studies suggest that the cumulative loss of calcium due to atmospheric deposition, considering the buffering effect of mineral weathering, is about 4 percent over 120 years (USDA-Forest Service, 2005b, FEIS, p 3-24). Given that the cumulative effects time period goes back 75 years, it is possible that up to 3 percent of the total soil calcium may have been removed during that time due to atmospheric deposition, and another <1 percent due to early harvesting methods. Atmospheric deposition may continue to deplete soil calcium, though evidence appears that soil and streams are recovering from the possible impacts of acid deposition (FEIS 3-26). Thus an estimated 4 percent of soil calcium may have been lost over 120 years (FEIS 3-24).

On-site evidence during timber and other inventories has not revealed any unusual dieback or mortality. Stands previously harvested in this vicinity have adequately regenerated (Administrative Files). As previously noted, no change in biomass accumulation has been documented at the nearby Bartlett Experimental Forest. Based on on-site evidence and the previously discussed research on biomass accumulation, it does not appear there are issues with soil productivity or forest health.

Action
Alternatives 2-5

Effects of atmospheric deposition would be no different in the Action Alternatives than in the No Action alternative.

The Action Alternatives have the potential to add new harvest impacts by removal of trees and their biomass. Alternative 4 would remove the most calcium because it proposes 148 acres of clearcut whole-tree harvest and 191 sts/gs/ thinning whole-tree harvest acres (refer to Table 18 for percent of calcium loss). Alternative 5 would remove the least amount of calcium because it proposes 52 acres of clearcut whole-tree harvest and 176 sts/gs/ thinning whole-tree harvest acres (refer to Table 18 for percent of calcium loss). Alternatives 2 and 3 fall in the middle with the amount of calcium removed, with 108 acres of whole-tree harvest clearcut and 227 acres of sts/gs/thinning proposed (refer to Table 18 for percent of calcium loss). However, referring to the 2005 FEIS, modeling of soil exchangeable calcium and base saturation for a northern hardwood forest at the Hubbard Brook Experimental Forest has shown little long-term effect of these factors as a result of timber harvesting. Changes in exchangeable soil calcium and soil base saturation from 1850 to 2000 were nearly the same with and without forest harvesting (USDA-Forest Service, 2005b, FEIS, pp 3-23 to 3-25). By following Forest Plan Standards and Guidelines, no adverse effects are anticipated with any of the action alternatives on soil productivity.

A view from Black Mountain Cabin looking west. The ridge in the foreground is south of Prospect Farm and contains the Quail and UST trails, and Marsh Brook Sale (1991). The background includes Popple North Sale Area (2005 - before harvest), 4 Miles Brook clearcuts (1994), and also shows Rocky Branch Ridge and Stairs Mountain.



Water Resources

Design Features Related to Water Resources (Appendix A)

- In the Wildcat River watershed, the corridor boundary of the Wild and Scenic River is 500 feet from the center of the river (Wildcat River Comprehensive River Management Plan, 2005). All stands proposed for harvest are located outside this corridor.
- The following soil and water conservation practices are emphasized for this project (*LRMP, Forest-wide, water resources, Soil and Water Conservation Practices, S-1, p 2-30*). Combined with Standards and Guidelines and BMPs, these are expected to be effective in meeting water quality standards (USDA-Forest Service, 2005b, FEIS, p 3-54).
 - o Timber harvest units were designed so that units do not span mapped perennial streams. This was a preventative practice to protect water quality. Its effectiveness would be monitored by the Timber Sale Administrator.
 - o The operating period of timber sale activities is limited to a specific season of harvest and/or ground conditions specified in the timber sale contract to minimize adverse environmental effects. This would be monitored by the Timber Sale Administrator.
 - o Skidding patterns are designed to fit the terrain to control the volume, velocity, concentration, and direction of runoff water in a manner that would minimize erosion and sedimentation. This preventative practice would be achieved by minimizing the length of skid trails, locating the skid trails in advance, adding drainage features such as waterbars, and designing skid trails to cross streams at right angles. This would be implemented by the Timber Sale Administrator.
 - o Upon completion of harvesting operations, skid trails would be closed and bare ground seeded as needed in areas where soil erosion potential occurs, such as steep ground and near stream crossings. The Timber Sale Administrator would designate the areas of disturbed soils that must be treated and monitor effectiveness of treatment.
 - o The erosive effects of water concentrated by roads would be minimized by practices such as constructing cross drainage structures and dispersing runoff away from surface water. This is a preventative practice which would be monitored by the Timber Sale Administrator until the ground is stabilized.
 - o The number of stream crossings are minimized. Necessary crossings are designed to provide for unobstructed flows during bankfull conditions, as well as for the passage of debris and aquatic organisms. All temporary stream crossings would be removed following use. The Timber Sale Administrator would visually monitor stream crossing sites to catch and rectify any problems in the early stage. This monitoring would continue until the area has successfully stabilized.

- o Maintain proposed and existing roads to prevent rutting and failures. Adequate maintenance and/or restriction of use can minimize erosion problems. The Timber Sale Administrator would visually monitor roads proposed for use and prescribe corrective measures as needed.

The Than Vegetative Management Project is located in the Ellis River and Wildcat River watersheds. The total acreage of the Ellis River watershed, from its headwaters to the confluence of Miles Brook, is approximately 10,900 acres. The total acreage of the Wildcat River watershed, from its headwaters to the confluence with March Brook, is approximately 7,800 acres. These watersheds are within the larger, 10-digit hydrologic unit code (HUC) Upper Saco River Watershed (0106000201).

Water Quantity

Affected Environment

The Analysis Area for direct and indirect effects on water quantity is the Wildcat River from its headwaters to the confluence with Marsh Brook, and the Ellis River watershed from its headwaters to the confluence with Miles Brook. These watersheds were delineated into smaller subwatersheds of first and second order perennial streams to analyze potential localized effects in closer detail. Water quantity in streams in the analysis area is directly related to the amount of precipitation that occurs throughout the year. At Hubbard Brook, 62 percent of precipitation becomes stream flow (Likens and Bormann 1995) and most of the rest is lost to evapotranspiration. The research at Hubbard Brook is in a forested environment similar to the one found in the analysis area. Therefore, the results of this research can be applied to the Proposed Action and its alternatives.

Direct and Indirect Effects on Water Quantity

Alternative 1: No Action

There would be no new direct or indirect effects on water quantity from implementation of Alternative 1 except that amount resulting from the existing erosion concern along Wildcat Brook Trail. Current and on-going management activities would continue, consistent with the 2005 LRMP.

Action Alternatives 2-5

Removal of vegetation through timber harvest can alter evapotranspiration rates. These altered evapotranspiration rates can result in changes to streamflow. The magnitude of the change to streamflow depends on the extent of change to the vegetation (Hornbeck et al. 1997). Research at Hubbard Brook indicates that reductions in basal area must approach 25 percent to obtain measurable responses in annual water yield (Hornbeck et al. 1993). These increases became greatly reduced 3-4 years after timber harvest, and became undetectable 7-9 years after harvest. Most of the

increase in water yield occurs during the summer in periods of low flow (Hornbeck et al. 1997).

Using the Hubbard Brook model, where less than a 25 percent reduction in basal area is determined, no measurable increase in discharge is expected in the channels associated with those sub-watersheds, because the Action Alternatives do not exceed the 25 percent threshold (Table 19). As described in the Forest Plan FEIS, although there may be small localized effects, no measurable increase in water yield is expected in the channels associated with any of the sub-watersheds, and there would be no change in stream stability resulting from an increase in discharge from the proposed timber harvest activities (USDA-Forest Service, 2005b, FEIS).

Table 19. Percent Basal Area Removed.

Sub-Watershed	Stream Type	% Basal Area Removed by Alternative			
		1	2 & 3	4	5
Ellis River upstream of confluence with Miles Brook	Perennial	0	1.7	1.7	0.7
Wildcat Brook	Perennial	0	1.9	2.5	0
Bog Brook	Perennial	0	4.6	0.7	0
Davis Brook	Perennial	0	17.2	17.2	2.1
Than Brook	Perennial	0	10.4	11.2	10.4
Wildcat River upstream of confluence with Bog Brook	Perennial	0	0.5	0	0
Wildcat River upstream of confluence with Marsh Brook	Perennial	0	5.1	5.1	2.4

Photo shows view of Mount Washington from Halls Ledge. Trees in the foreground block views of the project. Proposed units are to the left of the spruce in the center of the photo. The steep ridge at right is not in manageable lands.



Water Quality

Affected Environment

The Analysis Area for direct and indirect effects on water quality is the Wildcat River watershed from its headwaters to the confluence with Marsh Brook, and the Ellis River watershed from its headwaters to the confluence with Miles Brook. The State of New Hampshire designates these reaches as Class B. Class B is the second highest quality, considered acceptable for fishing, swimming, and other recreational purposes and, after adequate treatment, for use as water supplies. Surface waters in the analysis area are not currently used for public water supply purposes.

Under New Hampshire antidegradation provisions, all waters of the National Forest are designated as “Outstanding Resource Waters” (ORW) and shall be maintained and protected (NHDES 1999). Some limited point and nonpoint source discharges may be allowed, provided that they are of limited activity that results in no more than temporary and short-term changes in water quality. Such temporary and short-term degradation shall only be allowed after *all practical means* of minimizing such degradation are implemented (USDA-Forest Service, 2005a, LRMP, p 2-30). Standards and Guidelines, Best Management Practices (BMPs), Soil and Water Conservation Practices, and other mitigations elsewhere in the EA are “all practical means” and would be used should an Action Alternative be selected.

Water quality has been sampled seasonally in the Wildcat River watershed since 1991. The first station in the analysis area is located on the Wildcat River, just upstream of FR 233. Measurements indicate that sulfate is the dominant anion and calcium is the dominant cation. E.coli averaged 7 counts/100mL. Other measurements included: pH = 6.6, conductivity = 20 μ S/cm, temperature = 48.8°F, and turbidity = 0.9 NTUs. Total aluminum values ranged from 39-160ppb, and averaged 69ppb. The acute criteria for aluminum is 750ppb, while the chronic criteria is 87ppb (NHDES 1999). The second station is located on Wildcat Brook, just upstream of FR 233. Measurements indicate that sulfate is the dominant anion and calcium is the dominant cation. E.coli averaged 5 counts/100mL. Other measurements included: pH = 6.5, conductivity = 20 μ S/cm, temperature = 50.2°F, and turbidity = 0.8 NTUs. Total aluminum values ranged from 32-125ppb, and averaged 62ppb. Field review of streams in the watershed indicated that embeddedness was low, so sedimentation of streams did not appear to be an issue.

Basic water quality data was collected on October 12, 2005, on a tributary to the Ellis River between stands 23 and 28. Measurements were: pH = 6.31, conductivity = 11 μ S/cm, temperature = 51.5°F, and turbidity = 0.1 NTUs. Further downstream, between stands 26 and 28, measurements were: pH = 6.70, conductivity = 12 μ S/cm, temperature = 51.9°F, and turbidity = 0.1 NTUs. On October 28, 2005, the following measurements were made on an intermittent stream in stand 32: pH = 6.01, conductivity = 5 μ S/cm, temperature = 40.4°F, and turbidity = 0.0 NTUs. Field review of streams in the watershed indicated that embeddedness was low, so sedimentation of streams did not appear to be an issue.

The values measured in both watersheds are within the range of values typically seen on the White Mountain National Forest (Hornbeck et al. 2001).

No waters in the analysis area are listed by the State of New Hampshire as not meeting water quality standards for aquatic life, drinking water, recreation, or wildlife. However, some uses have not been assessed. In the State of New Hampshire, all surface waters are impaired for fish consumption and shellfishing due to statewide fish/shellfish consumption advisories caused by mercury. The source of this mercury is atmospheric deposition (NHDES 2004c).

A short section of the Wildcat River Trail is located in the floodplain of the Wildcat River. Field review has indicated that when the Wildcat River accesses its floodplain during high flow events, water is concentrated on the Wildcat River Trail, eroding the trail surface for about 500 feet and increasing sediment supply to the Wildcat River.

Direct and Indirect Effects on Water Quality

Alternative 1: No Action

There would be no increased direct or indirect effects on water chemistry, temperature, or sediment from implementation of Alternative 1 (No Action). The current condition would remain. Ongoing forest activities would not change water quality or impact existing uses. The Wildcat River Trail would continue to be a source of sediment when the Wildcat River accesses its floodplain and water concentrates on the trail.

Action Alternatives 2-5

Timber harvest has the potential to affect stream temperature and water chemistry at the localized scale. Analysis in the 2005 Forest Plan FEIS stated that impacts to temperature and water chemistry are minimized through the use of Standards and Guidelines and BMPs. These include the use of riparian buffers, watersheds not being completely harvested, and staggered harvest (USDA-Forest Service, 2005b, FEIS, p 3-51). Riparian buffers are considered the most effective factor for preventing nutrients and sediment from reaching a watercourse (Gilliam 1994).

Research at Hubbard Brook has indicated that intensive forest harvesting practices have the potential to lower the pH in water. Water quality data on the forest has indicated that lower pH values are associated with higher total aluminum concentrations (see Than Project Administrative Record). Since the pH of the stream is already slightly acidic, further decreases in pH are a concern due to metal mobilization, including aluminum, and resultant effects on existing uses, such as fish. A Hubbard Brook study concluded that clearcutting about 15 percent of a watershed did not measurably change the basic chemistry of the major 1st and 2nd order perennial streams in the watershed (Martin et al. 1986). All perennial streams in the analysis area are 1st or 2nd order. In the Action Alternatives,

no more than 5 percent of a perennial watershed would be treated by even-aged harvesting methods, including clearcutting (data in Than Project Administrative Record). It is therefore unlikely that changes in pH would result as a consequence of the Action Alternatives. Acidity has been shown to mobilize inorganic aluminum in the soils, which then enters stream water (Lawrence and Driscoll 1988). Since harvesting at the proposed levels is not expected to lower the pH (increase acidity) of streams, it is also not expected to increase the aluminum concentrations.

Research has shown that the usual harvest practices, such as those used on the White Mountain National Forest, do not result in large nutrient losses or sediment movement and do not pose a risk to water quality (Brown 1983). Implementation of the 2005 LRMP Standards and Guidelines would minimize any opportunity for sediment to reach the banks of any perennial streams. No harvest would occur within 25 feet of perennial stream banks, and only limited, uneven-aged harvest would be allowed within an additional 75-foot Riparian Management Zone. In addition, the Wildcat River Comprehensive Management Plan (CRMP) calls for a 500-foot corridor boundary from the center of the river. This large buffer applies to the Wildcat River, Wildcat Brook, and Bog Brook (Wildcat River CRMP 2005). All stands proposed for harvest are located outside of this corridor.

The Action Alternatives propose to relocate approximately 500 feet of the Wildcat River Trail out of the floodplain of the Wildcat River. Proposed work would involve rehabilitating the old trail location by restoring natural drainage patterns, as well as adding large woody material to the trail to slow water on the trail and store sediment. The wood would also serve to deter hikers from the old trail location and keep them on the new trail. Minimal ground disturbance would occur at the old trail location. Ground disturbance would occur at the new trail location during trail construction. This site, however, is outside the floodplain of the Wildcat River, and thus should not be a sediment source to the river.

The Action Alternatives propose to relocate the Bog Brook trailhead parking area and construct approximately 750 feet of trail to connect the new trailhead to the existing trail. Ground disturbance would initially occur both at the new trailhead parking area and along the new trail as ground is cleared. The trailhead location is approximately 750 feet from Wildcat Brook, and the new trail would not cross any streams, so sediment input into streams should not result from this trail construction.

Alternatives 3 and 4 propose the addition of approximately 2.3 miles of Nordic ski trail. While the majority of this trail is located in the Wildcat River watershed, approximately 1,200 feet of trail extends east of the Wildcat River watershed and into the East Branch Saco River watershed. The ski trail would use existing skid trails when possible to minimize new ground disturbance. Some ground disturbance would occur as a result of clearing this trail. There is one unmapped intermittent stream crossing along the length of this trail. A culvert spanning bankfull width would be installed at this stream crossing, so sediment inputs to surface water should be minimal.

Up to 500 feet of road construction is proposed under Alternatives 2-4. The road construction would be located approximately 1,000 feet from Wildcat Brook, the nearest mapped stream. All road construction would follow Forest Plan Standards and Guidelines as well as BMPs. By following standards and guidelines and BMPs, it is unlikely that sediment would reach Wildcat Brook. No road construction is proposed under Alternative 5.

Approximately 5.8 miles of existing road is proposed for reconstruction or maintenance under Alternatives 2-4, and 5.2 miles of existing road is proposed for reconstruction or maintenance under Alternative 5. Road reconstruction allows for a higher level of use than the road was originally designed for, such as summer and fall use on a road originally designed for winter use only. This includes improved drainage and surfacing on these roads. Road maintenance may involve cleaning culverts, blading the road surface, and/or road resurfacing. Although road reconstruction and maintenance may initially cause ground disturbance, improving and maintaining roads for their level of use can prevent future erosion. Research has shown that maintenance, such as resurfacing roads with a layer of gravel, reduces sediment losses (NCASI 2000).

Stream crossings can cause increased sediment inputs to streams during installation and use. One new log truck crossing is proposed across the Ellis River under Action Alternatives 2, 3, and 4. No crossing is proposed under Alternative 5. Permanent abutments would be installed, but the other bridge components would be temporary. In accordance with the 2005 LRMP, this temporary bridge would be designed to pass bankfull flows. In addition to the log truck crossing, five temporary skidder bridge crossings are proposed under Alternatives 2, 3 and 4, and three temporary skidder bridge crossings are proposed under Alternative 5. No skidder crossing of Wildcat River is proposed under any alternative. All skidder crossings would be designed to pass bankfull flows. They would all be located so as to minimize potential sediment inputs. In addition to these main skidder bridges, crossings of small, unmapped intermittent streams would be needed under all Action Alternatives. These crossings may occur with bridges, culverts, pole crossings, or other similar methods which prevent equipment from coming in contact with surface water and which meet State of New Hampshire Best Management Practices and Forest Plan Standards and Guidelines. Following harvest, all temporary crossing structures would be removed, stream banks restored as necessary, and any sediment inputs should be reduced to pre-harvest levels. Sediment problems associated with stream crossings can be very persistent (Stafford et al. 1996), so visual monitoring would occur at stream crossing sites to catch and rectify any problems in the early stage. This monitoring would continue until the crossing sites have successfully stabilized.

The magnitude of effects caused by sediment transport is related to area of disturbance. Areas which lack vegetation and have disturbed soils become the source for sediment transport, particularly near stream crossings. This area of disturbance associated with the Action Alternatives, as well as the number of stream crossings, is shown in Table 20. Alternative 2 disturbs

approximately 86 acres, Alternative 3 disturbs approximately 91 acres, Alternative 4 disturbs approximately 84 acres, and Alternative 5 disturbs approximately 36 acres. This amounts to approximately 0.5 percent of the analysis area for Alternatives 2-4, and 0.2 percent of the analysis area for Alternative 5. As areas of temporary disturbance (landings, skid trails, ski trails, hiking trails) revegetate, sediment contributions decrease to near zero. Sediment contributions from classified roads would continue; however, they would likely return to pre-project levels over time.

Table 20. Ground Disturbance, by Alternative.

Activity	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Haul Road stream crossings (count)	0	1	1	1	0
Skidder stream crossings (count)	0	5	5	5	3
Nordic Ski Trail stream crossings (count)	0	0	1	1	0
Landings (acres)	0	7	7	7	3
Roads Construction (miles/acres)*	0/0	0.1/0.2	0.1/0.2	0.1/0.2	0
Road Maintenance (miles/acres)	0/0	3.0/7.2	3.0/7.2	3.0/7.2	3.0/7.2
Road Reconstruction (miles/acres)	0/0	2.8/6.7	2.8/6.7	2.8/6.7	2.2/5.3
Skid Trails (miles/acres)	0/0	23.6/57	23.6/57	23.6/57	8.4/20
Nordic Ski Trail Construction (miles/acres)	0/0	0/0	2.3/5.5	2.3/5.5	0/0
Wildcat River Trail Relocation (miles/acres)**	0/0	0.1/0.1	0.1/0.1	0.1/0.1	0.1/0.1
Bog Brook Trail Relocation (miles/acres)	0/0	0.1/0.1	0.1/0.1	0.1/0.1	0.1/0.1
Bog Brook Trailhead Parking (acres)	0	0.1	0.1	0.1	0.1
Total Disturbed Acres	0	71.4	76.9	76.9	35.8
Total % of Watershed Disturbed	0%	0.5%	0.5%	0.5%	0.2%

*1 mile of road/skid trail/ski trail at an average disturbance width of 20' = 2.4 acres of disturbance/mile

**hiking trail width =5ft

Forest Plan Standards and Guidelines state that new skid roads and classified roads should not be located within the stream or pond management zone, which is a minimum of 50 feet in width. The width of this zone increases 20 feet with each increase of 10 percent in slope. In addition, where exposure of mineral soil is expected, skid roads should generally be located on grades of less than 20 percent, with only short steeper pitches. Roads and skid trails comprise the majority of disturbed ground in the proposed Than Project (see Table 20). By following standards and guidelines for riparian buffer widths on harvesting units and stream and pond management zones on skid trails and roads, as well as slope restrictions on skid trails, sediment is not expected to reach surface water.

Any direct and indirect effects on water quality resulting from the Action Alternatives are anticipated to be short-term and localized. Sedimentation resulting from existing conditions along the Wildcat River Trail would be reduced or altogether removed. Most studies show that BMPs are very effective at reducing or eliminating the transport of sediment into watercourses (summarized by Stafford et al. 1996). The Timber Sale Administrator would monitor the project area to ensure the implementation and effectiveness of standards and guidelines and BMPs. If conditions are not met, the operator would be shut down until problems were resolved. BMPs are also monitored as part of the Forest-wide monitoring of the 2005 LRMP. Use of 2005 LRMP Standards and Guidelines, Soil and Water Conservation Practices, and New Hampshire BMPs in every facet of the Action Alternatives would meet the Outstanding Resource Waters standard.

Cumulative Effects on Water Quantity and Water Quality

The Analysis Area for cumulative effects on water resources is the Wildcat River watershed from its headwaters to the confluence with Marsh Brook, and the Ellis River watershed from its headwaters to the confluence with Miles Brook. This scale watershed was selected because it includes all the headwaters of the streams that flow through the project area; and, at this scale, the effects of multiple uses within the watershed could become additive and result in cumulative effects. All waters within the cumulative effects area are 1st or 2nd order streams (see Figure 12).

The temporal scope for cumulative effects on water resources is 10 years past and 10 years into the future. Ten years is adequate for water quantity analysis because research at Hubbard Brook has shown that increases in water quantity following large-scale clearcuts became undetectable 7-9 years after harvest (Hornbeck et al. 1997). Ten years is also adequate for water quality analysis because research at Hubbard Brook has shown that the sum of measured ions (cation-anion summary) had returned to levels found before harvest within 5 years following treatment (Hornbeck et al. 1986).

Past and present activities that occur in the cumulative effects area (CEA) on Forest Service land include timber harvest and road maintenance and use. Activities on private land include timber harvest, road construction and maintenance, and residential development. There is no indication that future activities would deviate in type or scale from past and present activities. Atmospheric deposition occurs throughout the Northeast, including the CEA.

Water Quantity

No cumulative effects related to increased water quantity are expected in the analysis area. As discussed previously, the Action Alternatives are not expected to cause increases in water quantity. Timber harvest has occurred in the CEA in the last ten years. However, when combining past harvesting with the proposed level of harvest, basal area reductions do not exceed 25 percent (Than Project Administrative Record). No additional timber sales are planned in the CEA in the next ten years. It is therefore unlikely that

cumulative increases in water quantity would be observable as a result of the proposed project.

Water Quality

An existing cumulative effect on water chemistry exists due to atmospheric deposition. In addition to the existing cumulative effect, timber harvest can alter water quality through temperature change, chemical change, and sediment transport. Temperature and chemical changes are discussed together; sediment is discussed separately.

Water Chemistry and Temperature

Temperature measurements collected in the CEA indicated cool temperatures which support the existing uses in the watershed. The proposed project is not anticipated to cause increases in temperature. A cumulative effect related to stream temperature is not anticipated, even when combined with activities on private land.

An existing cumulative effect to water chemistry is atmospheric deposition. Atmospheric deposition refers to all pollutants carried by the air and deposited on land and water causing numerous effects, including acid rain. Acid deposition refers to those components in the air that reduce the pH of precipitation. The main pollutants responsible are sulfur and nitrogen oxides, primarily from the burning of fossil fuels by electric utilities and motor vehicles. Sulfur and nitrogen react with rainwater through chemical reactions, which lowers the pH of rain thereby increasing acidity (Likens and Bormann 1995). This rainwater reacts with soil, vegetation, and water resulting in changes in chemistry across the ecosystem, including increased sulfate and aluminum concentrations (Driscoll et al. 2001; USDA-Forest Service, 2005b, FEIS, p 3-51).

As reported in the summary of *Acid Rain Revisited* (Driscoll et al. 2001), reductions of SO₂ emissions since 1970 have resulted in statistically significant decreases in sulfate in wet/bulk deposition and surface water. However, while sulfate concentrations in lakes and streams have decreased over the last 20 years, they remain high compared to background conditions (Driscoll et al. 2001; USDA-Forest Service 1996). Long-term data from Hubbard Brook shows that the concentration of nitrogen in precipitation has been relatively constant since the early 1960s, when measurements began. These nitrogen concentrations are above background levels (Driscoll et al. 2001). New Hampshire has a fish consumption advisory for fish taken from all freshwaters due to mercury. The source of this mercury is atmospheric deposition (NHDES 2004c).

Research has indicated that changes in calcium, magnesium, and aluminum concentrations were proportional to basal area removal (Wang et al. 2006). When combined with past harvesting, the proposed project would result in a basal area removal in the CEA of less than 4 percent.

To protect against cumulative effects of atmospheric deposition on water quality from past and future timber harvest, the 2005 LRMP includes a guideline that limits the amount of even-aged harvest within the watershed of a first or second order perennial stream to no more than 15 percent of

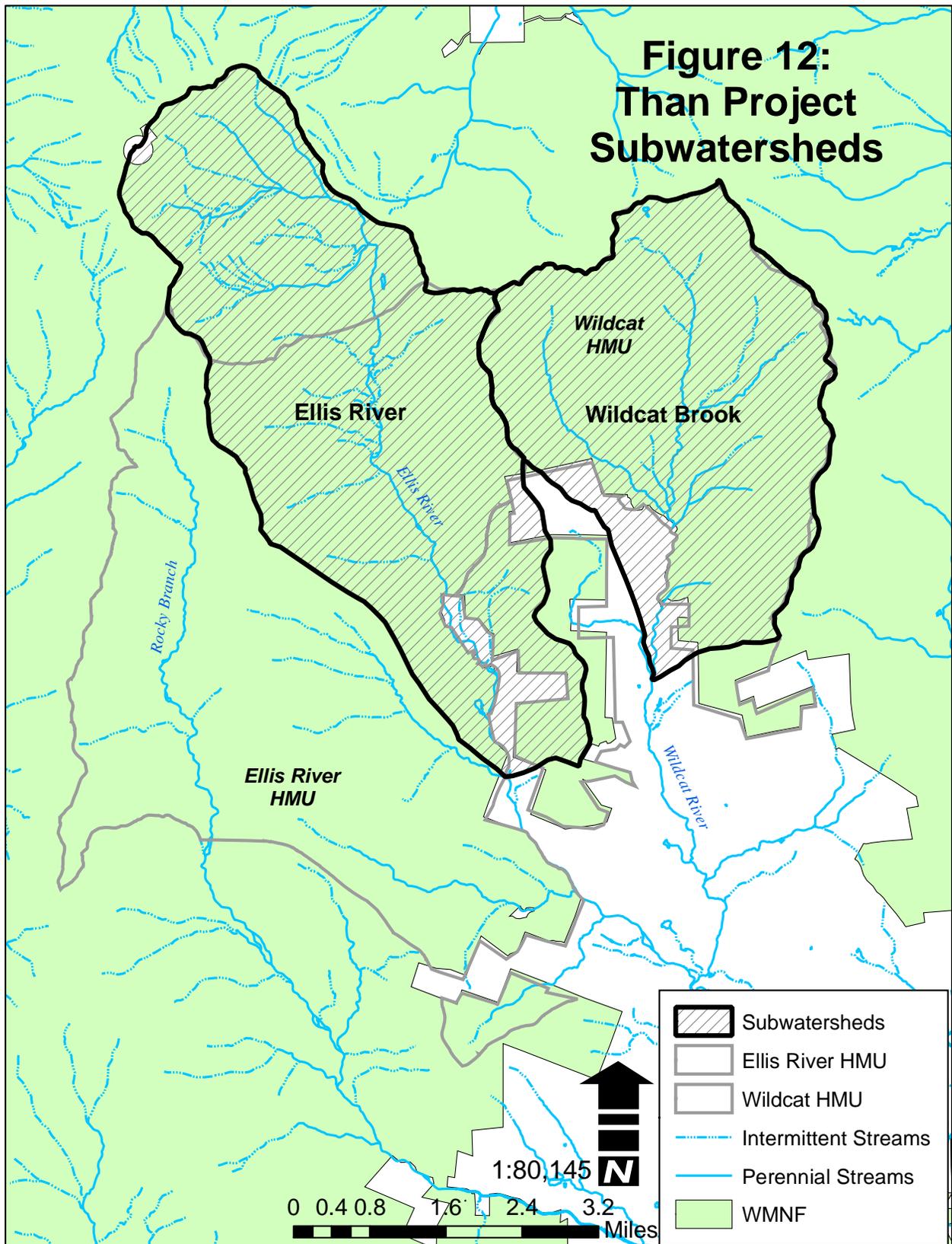
the watershed in a five year period (USDA-Forest Service, 2005a, LRMP, p 2-29). Past and proposed even-aged harvesting in the CEA accounts for less than 2 percent of the CEA. It is anticipated that some harvesting may occur in the CEA on private land in the next ten years. However, even if all private land in the CEA were clearcut, this would still not exceed the 15 percent threshold.

Private lands and inholdings constitute less than 7 percent of the cumulative effects area. At present, water quality and changes to runoff as a result of activities on private land are not causing the streams to be listed as not meeting water quality standards. However, research has indicated that watersheds with approximately 10 percent impervious surfaces have surface waters which are degraded (Morse and Kahl 2003). In the CEA, roads, skid trails, hiking and Nordic trails, and landings on public and private land account for approximately 1 percent impervious surfaces. Even if all private lands and inholdings were completely developed, this would not exceed the impervious surfaces threshold. Therefore, water quality changes related to impervious developed surfaces are not expected to occur.

Sediment

No cumulative effects related to sediment are expected in the analysis area. As discussed previously, any direct or indirect effects are expected to be short-term and localized. Road maintenance and resurfacing should reduce potential sediment inputs of existing roads (NCASI 2000). No known wildfires have occurred in the cumulative effects area, and no prescribed fire is proposed. Therefore, no cumulative effects on sediment related to fire are anticipated. Erosion problems related to recreational activities in the analysis area have been observed along the Wildcat River Trail. The proposed relocation of the trail out of the floodplain should result in reduced sediment loads to the river. No other major erosion problems related to recreation were observed in the CEA. No recreation projects are anticipated in the analysis area in the next ten years other than those currently proposed as part of the Than Project.

In summary, the Action Alternatives present a low risk of adding to cumulative effects on water quality, and may actually improve water quality through the Wildcat River Trail relocation project.



Riparian and Aquatic Habitats

Design Features Related to Riparian and Aquatic Habitats

- No heavy equipment is proposed for use on stream habitat improvement projects in the Wildcat River watershed.
- In the Wildcat River watershed, the corridor boundary of the Wild and Scenic River is 500 feet from the center of the river (Wildcat River Comprehensive River Management Plan 2005). All stands proposed for harvest are located outside this corridor.

Affected Environment for Riparian and Aquatic Habitats

A riparian area is a term used by the Forest Service that includes stream channels, lakes, adjacent riparian ecosystems, floodplains, and wetlands (USDA-Forest Service, 2005a, LRMP). Benefits of a healthy riparian area include dissipating stream energies associated with high flows, filtering sediment, developing of diverse channel characteristics to provide habitat for aquatic biota, and protecting stream banks from scour (Verry et al. 2000).

Conditions on Wonalancet Brook, which flows through old growth forest on the White Mountain National Forest, can be used as a baseline of natural woody material loading on the Forest. A study on Wonalancet Brook calculated an average of 281 pieces of large woody material per mile of stream. More than 46 pieces per mile were in the largest size class (>12 inches DBH); (Underwood et al. 1998). Extensive field surveys in the Wildcat River watershed indicated that while streams are relatively stable and riparian areas are generally functioning well, there is a lack of large woody material in the streams. Surveys of large woody material in Wildcat River, Wildcat Brook, Bog Brook, and Davis Brook found that counts ranged from 49-194 pieces/mile, with only 3-8 pieces/mile in the largest size class (>12 inches DBH); (data in Than Project Administrative Record).

The Analysis Area for direct and indirect effects on riparian and aquatic habitats is the Wildcat River watershed from its headwaters to the confluence with Marsh Brook, and the Ellis River watershed from its headwaters to the confluence with Miles Brook.

Direct and Indirect Effects on Riparian and Aquatic Habitats

Alternative 1: No Action

There would be no new direct or indirect effects on riparian and aquatic habitats from implementation of Alternative 1. Current and on-going management activities would continue, but no new management activities related to this project would be initiated. Large woody material levels in streams would remain low in the analysis area as there are few dead and dying trees in the riparian area that would naturally recruit into the streams.

Action
Alternatives 2-5

Timber harvest has the potential to alter physical stream characteristics, including riparian buffers. For those stands adjacent to Bog Brook, Wildcat Brook, or the Wildcat River, the stand boundaries are set back 500 feet from the centerline of the river. All other stands would have a 25-foot no-cut buffer and an additional 75-foot partial-cut buffer from the banks of the stream. Within this 75-foot partial-cut buffer, only uneven-aged silvicultural practices would be allowed, and a relatively continuous forest canopy would be maintained. These buffers should maintain and protect streams from any potential instability caused by timber harvest. In addition, they maintain trees near the stream channel for future recruitment of large woody material. The effectiveness of riparian buffers at preventing stream instability would be visually monitored during and after harvest.

Large woody material in streams increases pool frequency and size, forms and stabilizes gravel bars, increases stream complexity, and reduces flow velocities (summarized by Naimen et al. 2002). In addition, large woody material forming organic debris dams are vital in controlling sediment transport from a mountainous landscape (Likens and Bilby 1982). Storage of sediment behind these obstructions not only provides potential spawning gravels for fish, but prevents large accumulations of sediment lower in the watershed. The Wildcat River watershed has a long history of intensive timber management (Wildcat River CRMP 2005, p 32). This has likely limited the natural recruitment of large woody material in the headwaters of the Wildcat River.

A stream habitat improvement project has been designed to add large woody material to sections of Wildcat Brook, Wildcat River, Bog Brook, and Davis Brook and their surrounding floodplains to restore the natural functioning condition of the channels and the riparian areas under Alternatives 2, 3, and 4. Under Alternative 5, only Davis Brook would be treated. Up to 300 pieces/mile would be added to up to 6 miles of streams and floodplains. One of the goals of the Wildcat River Comprehensive River Management Plan is to “maintain a naturally functioning and appearing riparian zone” (Wildcat River CRMP 2005, p 34). This project would promote that goal.

Chainsaws and other hand tools would be used to cut and place large woody material in streams and their surrounding floodplains. No use of heavy equipment is proposed, meaning the source of wood would be near the stream channels and floodplains, as transport of wood is not possible. However, trees that are directly providing stability to the stream banks would not be removed. Removal of trees from the riparian area is not expected to impact future recruitment, because trees of varying age classes would be removed, leaving a well-distributed (both spatially and in age-class) stand. Another goal of the Wildcat River CRMP states, “Within the Wild and Scenic Corridor timber harvesting will be limited, but may occur to achieve specific visual, habitat, or salvage objectives.” (Wildcat River CRMP 2005, p 33) This would be one such habitat objective, as work is

expected to result in increased channel stability and improved habitat for aquatic life. Some small, temporary increases in turbidity may occur as a result of this project when the trees are placed into the stream bed. However, the beneficial results of the project outweigh these short-term impacts.

Cumulative Effects on Riparian and Aquatic Habitats

The Analysis Area for cumulative effects on riparian and aquatic habitats is the Wildcat River watershed from its headwaters to the confluence with Marsh Brook, and the Ellis River watershed from its headwaters to the confluence with Miles Brook. This scale watershed was selected because it includes all the headwaters of the streams that flow through the Project Area; and, at this scale, the effects of multiple uses within the watershed could become additive and result in cumulative effects. **The temporal scope for cumulative effects on riparian and aquatic habitats** is from 1880 to 2176. This time frame was chosen because harvesting in riparian areas began on the White Mountain National Forest in the 1880s, resulting in less than natural levels of large woody material in stream and on floodplains. Research in northern hardwood-forested ecosystems has indicated that, after 170 years or so, trees begin to die and fall over in increasing numbers (Likens and Bilby 1982). We could therefore expect those trees which are currently in the youngest age class to begin naturally recruiting to streams within the next 170 years.

Past and present activities that occur in the analysis area on Forest Service land include timber harvest, road maintenance and use, and recreation. Activities on private land include timber harvest, road construction and maintenance, and residential development. There is no indication that future activities will deviate in type or scale from past and present activities. There is a lack of large woody material in streams on the White Mountain National Forest, including the Cumulative Effects Area (CEA) (USDA-Forest Service, 2005b, FEIS, p 3-69).

An existing cumulative effect in the analysis area exists due to a lack of large woody material in streams. Mitigations such as vegetative buffer strips are expected to minimize the impacts of timber harvesting on stream stability, as well as retain trees near channels for future recruitment of large woody material. In addition, the stream habitat improvement work proposed in the Wildcat River watershed would increase the amount of large woody material to a more natural level. On private land, which accounts for less than 7 percent of the CEA, harvesting has occurred and would likely occur in the future. The State of New Hampshire has a timber harvesting law which states that within 50 feet of the streams in the CEA “no more than fifty percent of the basal area may be cut or otherwise felled each year, leaving a well distributed stand of healthy, growing trees.” (NH Division of Forest and Lands 2006) On private land adjacent to the Wildcat River, the river corridor management boundary is the 100-year floodplain or the 75 feet from the edge of the river, whichever is greater (Wildcat River CRMP 2005, p 31). By following these regulations, harvesting on private land would not likely contribute to cumulative effects on riparian and aquatic habitats.

Water Effects to Wild and Scenic River

In October 1988, Congress passed legislation designating segments of the Wildcat River and its tributaries as part of the National Wild and Scenic Rivers Act. Wildcat River, Wildcat Brook, and Bog Brook, located in the headwater segment of the river, are classified as scenic. The Wild and Scenic Rivers Act (WSRA) defines scenic river areas as “Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.” (Wildcat River CRMP 2005)

To meet the requirements of the National Wild and Scenic Rivers Act, the White Mountain National Forest conducted a river study in 1991 that applied the criteria for classification and identified those river segments that qualified as candidate Wild, Scenic, or Recreational River Areas. The White Mountain National Forest “developed and interpreted criteria for evaluating river values (unique, rare, exemplary) for 38 rivers,” and identified 36 rivers that “meet the outstanding criterion for one or more river values.” (USDA-Forest Service 2005b, FEIS, p 3-410) The 2005 LRMP lists these 36 rivers in Appendix C, Eligible Wild and Scenic Rivers. The 2005 LRMP also establishes a standard for managing Eligible Wild and Scenic Rivers to “maintain their classification and eligibility until Congress designates the segments or decides not to designate them.” (USDA-Forest Service, 2005a, LRMP, p 2-32)

The Analysis Area for direct, indirect, and cumulative effects on Wild and Scenic Rivers is the Headwaters segment of the Wildcat River, as defined in the Wildcat River Comprehensive River Management Plan, and the Ellis River watershed from its headwaters to the confluence with Miles Brook. This area was selected because it considers the effects of the Proposed Action and its alternatives on the Wildcat River and Ellis River both within the Project Area and downstream. **The temporal scope for cumulative effects on Wild and Scenic Rivers** is 1988 to 2020, because this considers activities that existed at the onset of the Wildcat Wild and Scenic River designation and the 1991 Wild and Scenic River study, and activities that might take place between the 2005 LRMP and the next round of Forest planning.

Before a river can be designated Wild and Scenic, it must be free flowing and possess one or more outstandingly remarkable values (ORVs). Three ORVs were identified for the Wildcat River: Scenery, History, and Recreation (Wildcat River CRMP 2005). The effects of the proposed action alternatives on these values are analyzed in the Visuals, Heritage Resources, and Recreation sections. The effects of the proposed Action Alternatives on the free flowing conditions of the Wildcat River were analyzed in a Section 7 determination (document in Than Project Administrative Record). This analysis found that the proposed Action Alternatives would not affect the free flowing character of the Wildcat River or its designated tributaries. Since there are no direct or indirect effects on the free flowing character of the river, no cumulative effects are anticipated. Any future projects on the Wild and Scenic River would require a Section 7 determination to ensure that the free flowing condition is not altered.

The Ellis River is an Eligible Wild and Scenic River (USDA-Forest Service, 2005a, LRMP, Appendix C). Under Alternatives 2-4, activities proposed in the Ellis River watershed include harvest in up to 13 stands, a truck haul crossing of the Ellis River (permanent abutments with a temporary bridge), and two temporary skidder bridge crossings on tributaries of the Ellis River. Under Alternative 5, activities proposed in the Ellis River watershed include harvest in 5 stands and one temporary skidder bridge crossing on a tributary of the Ellis River. No truck haul crossing is proposed under this alternative. No new road construction is proposed in this watershed under any Action Alternative. Riparian Standards and Guidelines require a 25-foot no-cut buffer and an additional 75-foot partial-cut buffer from the banks of mapped perennial streams. These riparian buffers are designed to protect the natural functions of floodplains and riparian areas. Because the riparian buffers keep the floodplain and riparian area intact and properly functioning, the proposed timber harvest should not impact the free flowing condition of the Ellis River in the long-term. The truck haul crossing of the Ellis River and the skidder bridges on tributaries to the Ellis River are also not anticipated to affect the free flowing condition of the river, because all stream crossings would span bankfull channel dimensions and would not constrict the channels. In addition, all crossings are temporary, and bridges would be removed and banks stabilized as needed following completion of the project.

Wild and Scenic Rivers

Issues Related to Wild and Scenic Rivers

- *Impacts to the values for which it was designated*

Affected Environment

In 1988, Congress designated segments of the Wildcat River and its tributaries as part of the National Wild and Scenic Rivers System (P.L. 100-554). The designation ensures that the free-flowing character and the river's outstandingly remarkable values (ORVs) for which it was designated are preserved. The Wildcat is the only designated Wild and Scenic River on the White Mountain National Forest.

The projects proposed under all alternatives are located within the Headwaters segment of the Wildcat River. This segment includes a portion of the Wildcat River, Wildcat Brook, and Bog Brook. The Headwaters segment is classified as Scenic. The Wild and Scenic Rivers Act defines Scenic river segments as "Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads."

The Congressionally-authorized study of the Wildcat River identified three ORVs for which the river was eventually designated. These values and their applicability to the Headwaters segment, as stated in the Comprehensive River Management Plan (USDA Forest Service 2005b) are:

1. **Scenery** — The Headwaters section and the project area lie in the Carter-Moriah Range providing outstanding natural and topographic scenery. Views within the headwaters include Mt. Washington, Carter Dome, Carter Notch, and Pinkham Notch. Expansive views of the Wildcat watershed are also possible from ridgelines and openings along the hiking and ski trails in the area.
2. **History** — The historical value applies largely to the Intervale and Jackson Falls segments of the river corridor, specifically the resort community of Jackson and the open pastures and fields. The applicability of this ORV to the Headwaters section is minimal.
3. **Recreation** — The Headwaters section of the corridor provides numerous dispersed recreation opportunities, including hiking trails, groomed and un-groomed Nordic ski trails, and hunting and fishing opportunities. The use of this area is generally low to moderate. Many of the trails follow the drainage divides of the Wildcat watershed due to the steep topography, allowing visitors to experience views of the Wildcat and its tributaries in a natural environment.

Direct and Indirect Effects on Wild and Scenic Rivers

The Analysis Area for direct and indirect effects on Wild and Scenic Rivers is defined as the Headwaters segment of the Wildcat River, as defined in the Wildcat Comprehensive River Management Plan or as Management Area 8.6 in the Forest Plan.

The components of the Than Project that would occur within the Wildcat Wild and Scenic River corridor are described in Table 21 by alternative. None of the harvest units proposed in the Than Project are located within the designated river corridor. As defined in the Wildcat River Comprehensive River Management Plan (USDA Forest Service 2005b), the Wildcat corridor boundary is 500 feet from the center of the river and its tributaries.

As required by the WSRA, a draft Section 7 Evaluation of these projects has been prepared and is located in the project Administrative Record. The Section 7 Evaluation, as well as the water resource sections of this document, found that none of the projects proposed would effect the free-flowing character of the Wildcat or its tributaries. Therefore, this discussion of effects will focus on the ORVs summarized in Table 22.

None of the proposed actions within the Wildcat Wild and Scenic River corridor are expected to have a measurable or long-term effect on the ORVs for which it was designated. The proposed actions will likely improve conditions contributing to the ORVs associated with values for which the river was designated. Long-term impacts are not expected for any of the alternatives.

Table 21: Components of the Than Project that would be within the Wildcat Wild and Scenic River Corridor by Alternative

Project Component	Alternatives under which this project is proposed	Desired Result
Using hand tools, place large woody material in the upper sections of Bog Brook, Wildcat Brook, and Wildcat River.	2, 3, 4, 5	Add structure to the streams to increase aquatic habitat diversity by creating pools and cover. Sediment stored behind large woody material provides spawning gravels for fish and prevents large accumulations of sediment lower in the watershed.
Add downed wood to the riparian areas adjacent to the streams where there is evidence of eroding side channels.	2, 3, 4, 5	Stabilize existing channels and floodplains and prevent the formation of unnatural side channels.
Relocate 500 ft of the Wildcat River Trail.	2, 3, 4, 5	Relocate this portion of eroding trail to higher ground to improve water quality and stabilize the trail.
Relocate a portion of the Bog Brook Trail to new trailhead location on FR 233.	2, 3, 4, 5	Create an improved trailhead on Town or Forest Service land to safely accommodate visitors to Prospect Farm and National Forest land. The section of trail from the existing trailhead would be abandoned, resulting in little net gain of trail mileage.

Table 22: Direct and Indirect Effects on ORVs by Alternative

Alternative	Scenery	History	Recreation
1	None	None	None
2	The addition of woody material is not expected to negatively impact the scenic qualities.	Applicability to headwaters segment is minimal. Vegetation and recreation management has occurred throughout the area in the past. This ORV is most applicable to the Intervale and Jackson Falls segments outside of the Forest boundary.	Improve recreation opportunities through trail relocations while not increasing use levels or trail density. The addition of woody material to stream may improve fish spawning habitat and rearing success, which would improve angling.
3	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.
4	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.
5	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.

Cumulative Effects on Wild and Scenic Rivers

The Analysis Area for cumulative effects on Wild and Scenic Rivers is defined as the entire designated Wildcat Wild and Scenic River corridor. This includes the direct and indirect effects analysis area and also private and Town of Jackson lands to the south along the river corridor to the Jackson Falls segment. **The temporal scope for cumulative effects on Wild and Scenic Rivers** is 1988 to 2020, because this considers activities that have occurred since the time of the Wildcat's designation and 2020, when the next Forest Plan revision may take place.

As stated in the water resources section of this document and the Section 7 Analysis, the free flowing character would not be either directly or indirectly affected by any of the actions proposed. Therefore, no cumulative effects are anticipated on the free flowing character of the Wildcat.

This project is the only vegetation management project that has been proposed in the vicinity of the Wildcat since the mid-1980s. No other recreation, fisheries, or vegetation management projects are planned in the foreseeable future for this area. The Scenic ORV is the only factor which may result in any cumulative effect. However, the Comprehensive River Management Plan identified the scenic values for the river segments on private and town land:

The portion of the Wildcat, from Hutman's Trail to above Jackson Falls, provides a different type of scenery. The topographic enclosure of Spruce and Eagle Mountains, as well as the open fields, forests, meadows, and pastures also provide high visual quality.

Within the Jackson Falls area, the scenery and visual quality of the Wildcat River is characterized by the presence of Jackson Falls, its rocky shoreline, changing flow patterns, culturally significant buildings, and the Valley Cross Road Bridge. Each of these features and characteristics provides intimate and diverse attractions with strong public appeal to residents and visitors.

The changes to the visuals as a result of proposed projects would not affect the scenic qualities as identified in the Comprehensive River Management Plan. Therefore, no significant cumulative effects upon the Wildcat Wild and Scenic River's ORVs are anticipated, regardless of the alternative selected.

Eligible Wild and Scenic Rivers

Affected Environment

In the early 1990s, the White Mountain National Forest completed an assessment of rivers on the Forest to determine their eligibility to be considered for potential future inclusion into the National Wild and Scenic River System (NWSRS). During the recent Forest Plan Revision, this assessment was reviewed and updated (USDA Forest Service, 2005, LRMP, Appendix C).

The Ellis River, a portion of which is within the Than Project Area, is an eligible Wild and Scenic River (USDA Forest Service, 2005, LRMP, Appendix C). The eligible Ellis River is divided into four segments. The

segment in and adjacent to the Than Project is 2.3 miles in length, beginning just south of Glen Ellis Falls and continuing downstream approximately 2.3 miles to the Forest boundary where Route 16 crosses the Ellis River.

Forest Plan standards state: “Manage eligible rivers to maintain their classification and eligibility until Congress designates the segments or decides not to designate them.” Additionally, Forest Service Handbook 1909.12 (Chapter 80, rev. January 2006) requires that the outstandingly remarkable values of eligible rivers be protected. To be considered eligible for potential inclusion into the NWSRS, a river must be free-flowing and possess one or more outstandingly remarkable values (ORVs).

The outstandingly remarkable values for which this segment of the Ellis River (from southern boundary of Pinkham Notch Scenic area 2.3 miles downstream) is considered eligible are:

1. **Recreation** — This segment of the Ellis River provides unique and challenging opportunities for whitewater kayaking during spring snow melt and other high flows. It is one of the most significant and popular whitewater runs in central New England, including a significant section of Class IV gradient (<http://www.nps.gov/ncrc/programs/rtca/nri/states/nh.html>). The level of use is generally low for this activity. This section of the Ellis River also provides numerous dispersed recreation opportunities, including fishing, dispersed camping, and swimming similar to many other rivers on the White Mountain National Forest. The use of this area is generally low to moderate, including the Hall’s Ledge Trail, which is the only National Forest System trail in this segment of the Ellis River.
2. **Wildlife** — Terrestrial wildlife populations and habitat are not unique or rare within the region of comparison. Generalist species frequent the area, but no unique population is supported. However, the aquatic environment provides suitable habitat for two mayfly species with potential viability concerns. One of these, Brown’s Ameletus Mayfly, has been documented near Glen Ellis Falls, just above this segment of the Ellis River. The Brown’s and Third Ameletus Mayfly have similar habitat requirements found in this section of the Ellis River, including well-oxygenated, high pH, canopy covered, and rocky streams. Both species are expected to be listed on the Regional Forester’s sensitive species list in 2007.

The forest-wide river assessment completed in 1990 also included identification of the potential classification of each river or river segment. The segment of the Ellis River in and adjacent to the Than Project area was identified as having a potential classification of Recreational. Recreational rivers are defined as “Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.” (Wild and Scenic Rivers Guidelines, Federal Register, Vol. 27, No. 173, September 7, 1982)

The classification criteria for recreational river areas are described in Table 22a.

Table 22a: Classification Criteria for Recreational River Areas*

Attribute	Recreational Criteria
Water Resource Development	Some existing impoundment or diversion. The existence of low dams, diversions, or other modifications of the waterway is acceptable, provided the waterway remains generally natural and riverine in appearance.
Shoreline Development	Some development. Substantial evidence of human activity. The presence of extensive residential development and a few commercial structures is acceptable. Lands may have been developed for the full range of agricultural and forestry uses. May show evidence of past and ongoing timber harvest.
Accessibility	Readily accessible by road or railroad. The existence of parallel roads or railroads on one or both banks as well as bridge crossings and other river access points is acceptable.
Water Quality	No criteria are prescribed by the Wild and Scenic Rivers Act.

* Wild and Scenic Rivers Guidelines, Federal Register, Vol. 27, No. 173, September 7, 1982

The potential recreational classification takes into account the river’s proximity to NH 16, nearby residential and commercial development in the Town of Jackson, and management activities on National Forest land.

Direct and Indirect Effects on Eligible Wild and Scenic Rivers

The Analysis Area for direct, indirect, and cumulative effects on eligible Wild and Scenic Rivers is the river bed and ¼ mile from banks of the Ellis River in the 2.3 mile section from the southern boundary of the Pinkham Notch Scenic Area (near Glen Ellis Falls) south for 2.3 miles through the Than Project. The components of the Than Project that would occur within the analysis area are described in Table 22b.

Table 22b: Project Components in Eligible Wild and Scenic River Area

Alternative	Project Components within Ellis Eligible Wild and Scenic River Area
1	<ul style="list-style-type: none"> • None
2	<ul style="list-style-type: none"> • Reconstruction of NFSR 5555, including Ellis River Crossing that entails permanent abutments and a temporary bridge. • 17 acres of regeneration harvest in Unit 31 • 16 acres of group and single tree selection harvest in Unit 30
3	<ul style="list-style-type: none"> • Same as Alternative 2
4	<ul style="list-style-type: none"> • Same as Alternatives 2
5	<ul style="list-style-type: none"> • None (same as Alternative 1)

None of the actions described in any of the alternatives would compromise the free flowing character of the Ellis River. The discussion of effects to the free flowing character can be found in the Water Effects to Wild and Scenic Rivers section.

The Than Project does not propose any water resource developments in the Ellis River or any other waterway. Therefore, the water resource development criteria for the recreational classification will not be discussed. Also, as the Wild and Scenic Rivers Act does not prescribe criteria for water quality for the recreational classification, those criteria will not be analyzed (see Table 22a).

However, see the water resources section for information regarding effects of this project upon water quality.

Table 22c describes the effects of each alternative to the applicable recreation classification criteria and outstandingly remarkable values for which this section of the Ellis River is considered eligible.

Table 22c: Summary of Effects on the Ellis River eligible Wild and Scenic River by Alternative

Effects to Outstandingly Remarkable Values		
Alternative	Recreation*	Wildlife**
1	None	None
2	Presence of bridge may temporarily effect kayaking during high flows by serving as an obstacle for the duration of the sale. The permanent abutments will not serve as obstacles in the long term	Forest Plan standards and guidelines and best management practices will protect streams during harvest activity, road construction, and bridge installation minimizing reduction in canopy cover, removal of riparian vegetation, and sedimentation. Impacts to other species are expected to be localized and short-term.**
3	Same as Alternative 2.	Same as Alternative 2.
4	Same as Alternative 2.	Same as Alternative 2.
5	Same as Alternative 1.	Same as Alternative 1.
Effects to Recreation Classification Criteria		
Alternative	Shoreline Development	Accessibility
1	None	None
2	Presence of permanent abutments and timber harvesting activity are acceptable in a recreational river area.	The presence of a temporary bridge is acceptable in a recreational river area. The bridge will be present only for the duration of the timber harvesting activity.
3	Same as Alternative 2.	Same as Alternative 2.
4	Same as Alternative 2.	Same as Alternative 2.
5	Same as Alternative 1.	Same as Alternative 1.

*Other effects upon recreation from the Than Project can be found in the recreation section of this document (Section 3.1).

** Effects upon the outstandingly remarkable value of wildlife are discussed in further detail in Appendix B of this document (Species Viability Evaluation).

Alternatives 1 and 5 will have no effect on the ORVs or the recreational classification of this segment of the Ellis River. Neither alternative proposes any actions within the Ellis River eligible Wild and Scenic River area.

Alternatives 2, 3, and 4 are the only alternatives that propose actions within the eligible Wild and Scenic River area. However, the road reconstruction, timber harvest, permanent bridge abutments, and temporary bridge proposed in these alternatives are not inconsistent with a recreational classification. The shoreline development, vegetation management, and access provided by these actions are consistent with the recreation classification criteria described in Table 22a. These components of the Than Project may have minor, short-term impacts on the ORVs of recreation and wildlife. However, once the temporary bridge is removed following timber harvest activities, the temporary impacts to the ORV of recreation will not remain. The effects to the ORV of wildlife will also be transitory and temporary, minimized by the Forest Plan Standards and Guidelines and use of Best Management Practices.

3.6.3.2 Cumulative Effects on Eligible Wild and Scenic Rivers

The Analysis Area for cumulative effects on Wild and Scenic Rivers is defined as the entire Ellis River eligible Wild and Scenic River. This includes the direct and indirect effects analysis area and the 2.3 miles downstream and the 4.2 miles upstream to the headwaters. **The temporal scope for cumulative effects on eligible Wild and Scenic Rivers** is 1990 to 2020, because this considers activities that have occurred since the time of the eligibility determination in 1990, and 2020 when the next Forest Plan revision may take place. Since there would be no significant direct or indirect effects on the recreation classification criteria, no significant cumulative effects are anticipated. Therefore, the cumulative effects discussion will focus on effects to the ORVs.

The ongoing Popple Vegetation Management Project south of the Than Project Area may result in some temporary and short-term sedimentation to the southern portion of the Ellis River. Due to the incorporation of Best Management Practices and Forest Plan Standards and Guidelines, significant long-term or cumulative effects are not expected when combined with the Than Project or the other potential future projects described below.

Other known future projects that may affect the Ellis eligible Wild and Scenic River are still in the planning stages and are located on the Androscoggin Ranger District. The first is the Pinkham Notch Visitor Center parking lot resurfacing and reconfiguration project that may include a pedestrian bridge over the Ellis River near the visitor center. The second project is the reconstruction of the Glen Ellis Falls parking lot, which is in the early planning stages. The last project is the potential issuance of a special use permit to Verizon for the installation of underground fiber optic cable in the right-of-way of Route 16 between Gorham and Jackson.

All projects on the Androscoggin Ranger District will comply with Forest Plan Standards and Guidelines, as well as Best Management Practices aimed at reducing sedimentation from such activities into streams and protection

of Brown's and Third Ameletid Mayfly habitat. Even if the Than Project, the Pinkham and Glen Ellis Falls parking lot projects, and the Verizon fiber optic line were to co-occur, the additional sedimentation from these projects would be temporary and localized. No long-term affects to the wildlife ORV of the Ellis River, for which it was determined eligible, are anticipated.

Both parking lot projects in the planning stages would be aimed at improving the recreation qualities of the Ellis River. The pedestrian bridge that may be proposed near the Pinkham Notch parking lot is not in an area used by kayakers, because this portion of the Ellis River is not of sufficient size or gradient in this area to support whitewater kayaking. The Glen Ellis parking lot reconfiguration and the Verizon line would not impact water recreation opportunities on the Ellis River. Cumulative effects to the recreation ORV are not anticipated.

Fisheries

Issues related to Fisheries:

- *The project could affect the ecological features of the area.*

Affected Environment

The headwaters of the Wildcat River watershed and a portion of the Ellis River watershed make up the analysis area for the Than Project regarding fisheries. Tributaries to the Wildcat River include Wildcat Brook, Bog Brook, Davis Brook, Than Brook, and Marsh Brook. There are several unnamed tributaries in the project area covering the portion of the Ellis River watershed.

Wildcat River and the tributaries named above were inventoried for stream habitat conditions in 1991 using the Hankin and Reeves method. All streams were found to be low in pool to riffle ratio and large woody debris (USFS 1991 unpublished data). The Ellis River was inventoried for stream habitat conditions in 1988 using the transect method. This method combines pool habitat and spawning habitat and it is, therefore, difficult to split out individual amounts. Based on the majority of all stream surveys conducted on the WMNF, it is expected the Ellis River would also be low in pool to riffle ration and large woody debris.

Although fish data is not available from within the project area, eastern brook trout (*Salvelinus fontinalis*) are believed to be the only native species of fish in these waters based on other headwater streams on the Saco District. New Hampshire Fish and Game stocking records indicate Wildcat Brook has been stocked sporadically in the past with eastern brook trout, with the last stocking occurring in the early 1990s. Records indicate Wildcat River has been stocked with eastern brook trout on a more regular basis, but primarily at the lower sections of the river and not in the headwaters. Brown trout (*Salmo trutta*) were occasionally stocked in the lower Wildcat River (off National Forest land), as were rainbow trout (*Salmo gairdneri*). There are no records of Bog Brook, Davis Brook, Than Brook, or Marsh Brook being stocked.

The headwaters of the Ellis River in Pinkhams Grant have been stocked only with eastern brook trout over the years. The Ellis River in the area of Jackson has been stocked with eastern brook trout and rainbow trout on an annual basis. In 1985, this section was also stocked with brown trout but no brown trout have been stocked since (NHFG 1990-2005). Brook Trout were the only fish caught during surveys conducted in the Ellis River in 2002 (USFS 2002 unpublished data). The lowest survey site was in the vicinity of the Hutman's Trailhead. The second site upstream was just above the Dana Place Inn, and the third survey was conducted half-way between the second survey site and Glen Ellis Falls.

American toads, wood frogs, green frogs, three species of stream salamanders, and numerous macroinvertebrates have been observed during numerous field visits. Two species of concern may exist in these watersheds. These two mayflies prefer cold headwater streams with a relatively high pH. See the Species of Concern section for effects analysis to these species.

Factors important to maintain quality habitat for brook trout include cool continuous flowing water, unimpeded travel upstream and downstream, clean gravels for spawning and egg incubation, clear water during the growing season, instream cover, adequate food supply (usually macroinvertebrates), sufficient quality pools during drought and winter, and suitable riparian habitat.

Direct and Indirect Effects on Fisheries and Aquatic Habitats

The Analysis Area for direct and indirect effects on fisheries and aquatic habitats is the Wildcat River watershed from its headwaters to the confluence with Marsh Brook, and the Ellis River watershed from its headwaters to the confluence with Miles Brook as this encompasses all flows from the project area.

Alternative 1: No Action

The Ellis River and the Wildcat River watershed provide a recreational fishery. Current conditions are a result of past actions. Canopy cover currently exists over these streams; however, there is a lack of large wood in the stream itself as well as in the riparian areas. There is also a lack of quality pools.

There would be no direct effects on brook trout or aquatic habitat from the No Action alternative. Streams and riparian areas would continue to function much in the same way as at present. Fish communities and densities would be dependent upon the location and magnitude of existing pools and cover. This is the indirect and cumulative effect on fisheries and aquatic habitat of taking No Action.

Alternative 2:
Proposed Action

Timber

All harvest units are at least 500 feet from any of the streams covered by the Wildcat River Wild and Scenic River designation. This would eliminate any sedimentation resulting from harvest methods from entering these streams. Harvest units along streams that are not within the Wild and Scenic River designation would follow riparian standards and guidelines as outlined in the Forest Plan. Logging equipment would not enter stream courses, thereby eliminating direct effect to trout or aquatic organisms. Harvest prescriptions in riparian areas would promote trees providing canopy cover, future large woody debris recruitment, and bank stabilization. Forest Plan Standards and Guidelines would be followed.

No harvest would occur within 25 feet of perennial stream banks. This would reduce or eliminate any sedimentation entering the stream from harvest implementation. Recognizable seeps and vernal pools would also have a no-cut zone of 25 feet. This would eliminate or reduce negative effects to these habitats.

Roads

Roads currently within the project area are distanced from perennial streams except where they cross. Temporary log skidder bridges would be removed upon completion of the sale. Based on past experience from other similar crossings, implementing Forest Plan Standards and Guidelines would limit sedimentation and effects would be minimal.

The bridge over the Ellis River to access units 29-33 would have a permanent abutment on the west side of the river to raise the bridge level above bank-full of the Ellis River. A permanent sill would be placed on bedrock on the east side of the river, at the high water line. There is some potential for siltation to occur at this site; however, watershed restoration work done on other streams within the WMNF has shown this to be localized and of a short duration if it does occur (USFS 2005c and 2006d monitoring data on Great Brook). Forest Plan Standards and Guidelines would be followed to limit sedimentation entering the river. The bridge abutments would have no effect on brook trout, as they would be outside the stream channel and normal flows.

Recreation

The proposed relocation of a section of Bog Brook Trail would have minimal direct impact to brook trout or other aquatic species. Currently the brook leaves its banks during high flows, with water coursing down a section of Bog Brook Trail. Past management has put in more waterbars to minimize erosion; however, water still flows down the trail during high rain events. Relocating the trail would not eliminate water from flowing over this section but it would allow for vegetation to grow and reduce erosion in this area. In addition to relocation of this section of trail, trees would be cut in place at this site to increase the roughness of the riparian area. This would slow water movement over this area, allowing for sedimentation to occur.

Sediment would provide a bed for new vegetative growth to occur, slowing water movement even more in this area. This action also would obliterate the trail so hikers would not continue to trample vegetation in this area.

The proposed relocation of the Bog Brook trailhead and parking would have no impact to brook trout, as it is several hundred feet away from any perennial stream.

It is expected that fish would continue to be stocked in the streams that are currently being stocked. This provides anglers with larger fish in the lower sections of the Wildcat and Ellis Rivers, along with relatively easy access. The headwaters of the Wildcat River watershed would remain unstocked and provide a wild trout fishing experience. The permanent bridge abutments proposed for the Ellis River crossing would have no effect on fish or anglers in this area.

Aquatic Enhancement

The proposal would add wood to the headwaters of Wildcat River, Wildcat Brook, Bog Brook, and Davis Brook. All proposed actions are compatible with the Wild and Scenic Management Designation for the Wildcat River and its tributaries, Wildcat Brook and Bog Brook (USFS 2006b). Required permits would be obtained prior to implementation. Logging of the forest at the turn of the century included the headwaters of the Wildcat River, and is evidenced by the abundance of second-growth forest. Much of the analysis area has yet to attain the large diameter tree sizes of pre-timber harvesting. Wood falling into streams influences the hydrological function and causes scouring that forms pools (Underwood et al. 1998). Pools provide resting and foraging areas for brook trout. Scouring creates sedimentation that settles out creating point bars and sinuosity and, in other areas, spawning gravel for trout. Logs also collect debris and increase the nutrient level of the stream (Underwood et al. 1998; Fudge 1998; Faustini and Jones 2002). This would increase the prey base of macroinvertebrates for brook trout.

Habitat surveys conducted on these streams in 1991, using a Rankin and Reeves protocol, indicated Wildcat River had 114 logs per mile but 77 of those were in the small-size category. The stream consisted of 10.6 percent pools. Wildcat Brook had 49 logs per mile with 37 in the small-size category and eleven percent of the brook was in pool habitat. Bog Brook had 194 logs per mile with 148 in the small-size category and 17 percent of its habitat in pools. Davis Brook had 124 logs per mile, 91 were in the small-size category and it had only 0.3 percent pool habitat.

The proposal would increase the amount of wood to approximately 300 pieces of wood per mile on average in the headwaters of Wildcat River, Wildcat Brook, Bog Brook, and Davis Brook. Projects previously implemented on the WMNF (Great Brook and Evans Brook in Maine) have shown this to be compatible with surrounding riparian requirements (Prout, personal communication 2006). Streams proposed for work are stable, with minimal eroding of banks, and stream channels show moss covered rocks indicating little bed-load movement. This indicates that the streams are highly suitable to habitat improvement by the addition of

woody debris in the form of mid- to large-sized logs. Logs would be added where large woody debris would form pools and cover or would protect banks.

Work would occur over approximately 2 miles of Wildcat River, from the Forest Service boundary to near the junction with the Wild River Trail. In addition, approximately 0.3 miles of an unnamed tributary near the confluence would be treated with wood. Wildcat Brook would be treated from the confluence to approximately 2 miles upstream. Bog Brook would be treated from the confluence to the bog to approximately 1.5 miles upstream. Davis Brook would be treated from the confluence to approximately 0.5 miles upstream.

Implementation would occur during summer months when stream flows are typically lower. There may be a short increase in sedimentation during implementation; however, experience from other stream projects done on the WMNF has indicated this is temporary, and normal conditions return within a few hours (Milot, personal communication). Work would be conducted by hand labor using chainsaws and power winches. Trees would be cut in the riparian area, but canopy cover would be retained to ensure stream temperatures would not increase.

In addition, logs would be cut in the riparian floodplain and left on the ground to slow water movement during high flows and to prevent new side channel formation. Up to 300 logs per mile (150 on each side of the stream and in the stream) would be used to implement this proposal.

The effect of cutting trees on wildlife is discussed in the wildlife section. Individuals of species may be impacted, but no species is expected to be impacted to the point that their viability is a concern. Effects of this riparian work on brook trout would be potential short-term increase in sedimentation and possible site-specific changes in water quantity, depending on whether the downed logs divert water back to the brook or away from the brook. This is decided for each specific location along the brook. Expectation is that there would be no discernable alteration of water quantity for the stream as a whole. Therefore, there would be no discernable effect to brook trout.

Alternative 3

This alternative is identical to Alternative 2, except for season of harvest for some of the units and the proposal of a new Nordic ski trail.

Under this alternative, several units would be harvested only in the non-winter season to reduce the impacts to Nordic skiers in the area. This would have minimal differences in effects to fisheries in the project area. The units to be harvested only during summer or fall would be units 23 through 28, thus eliminating the need to plow FR 512, used as a Nordic ski trail during the winter. As there are no brook crossings along this road, there would be no effects to the fisheries resource.

Alternative 3 proposes a new Nordic ski trail be constructed from the end of FR 233 (south end of Unit 9), to switch back up through harvest units 2, 6, 5, and 4, and to eventually connect with the East Pasture Loop trail.

This proposed trail crosses no perennial streams and would therefore have no effects on the fisheries resource.

Alternative 4

Effects from harvest, roads, trail relocations, and watershed restoration under Alternative 4 would be similar to those described under Alternative 2. No harvest unit is within 500 feet of any designated Wild and Scenic River. All Forest Plan Standards and Guidelines would be followed.

Alternative 4 proposes a Nordic trail from the end of FR 233 through harvest units 2-6 to East Pasture trail. The proposed trail crosses no perennial streams and would therefore have no effects on fisheries.

Alternative 5

Under this alternative, all units within the 2004 Inventoried Roadless Area are dropped from harvest proposals. This eliminates the need to cross the Ellis River. There would be no effect to fisheries in the Ellis River under this alternative. All other harvest units would have similar effects to those described under Alternative 2.

Only Davis Brook would have watershed restoration work done under this alternative. Effects for this stream would be similar to those described under Alternative 2. For Wildcat River, Wildcat Brook, and Bog Brook, natural processes (trees falling into streams and bank erosion) would occur, but recovery to natural levels would be several hundred years in the future.

Cumulative Effects on Fisheries and Aquatic Habitats for All Alternatives

The Analysis Area for cumulative effects on fisheries and aquatic habitats is the Wildcat River watershed from its headwaters to the confluence with Marsh Brook, and the Ellis River watershed from its headwaters to the confluence with Miles Brook. This scale was selected because it includes all the headwaters of the streams which flow through the Project Area; also, at this scale the effects of multiple uses within the watershed could become additive and result in cumulative effects. **The temporal scope for cumulative effects on fisheries and aquatic habitats** is from 1880 to 2176. This time frame was chosen because harvesting in riparian areas began on the White Mountain National Forest in the 1880s, causing fisheries habitat to be greatly altered. Research in northern hardwood forested ecosystems has indicated that after 170 years or so trees begin to die and fall over in increasing numbers (Likens and Bilby 1982). It could, therefore, be expected that those trees currently in the youngest age class would begin naturally recruiting to streams within the next 170 years.

The fishery resource has been sustained over the years in the Wildcat and Ellis River watersheds primarily through natural processes, though logging has occurred periodically since the late 1800s. Brook trout were probably most impacted when the area was cut over in the late 1800s. Logging was extensive, with little to no mitigations for riparian areas or stream crossings.

Expectations are that past actions increased sedimentation, siltation, and stream temperatures, and removed large wood from the stream channel. These would have negatively impacted brook trout and their habitat. No logging has occurred in the headwaters of Wildcat River since the 1980s, except for the Marsh Brook sale around 1991.

The proposed action and alternatives may contribute some sedimentation to brooks within the project area, but meeting Forest Plan Standards and Guidelines would minimize the magnitude and duration.

Under any of the action alternatives, there would be little to no measurable negative cumulative effect on brook trout because implementation of Forest Plan Standards and Guidelines would minimize detrimental effects. As shown in the Water Resources section, negative cumulative effects are not expected with regard to stream condition, water quantity, or water quality. Proposed harvest is not expected to contribute to watershed instability, directly or cumulatively, including harvesting on private lands. Implementation of any action alternative would ultimately improve watershed conditions and thereby improve habitat by creating more diversity for trout and other aquatic species. Implementation of any of the alternatives would not cause a change in the forest or regional brook trout population trend under any of the alternatives. The expectation is that brook trout would remain viable under any alternative.

There are currently no harvests planned in the foreseeable future. Harvests are typically planned for areas on a 15-20 year rotation. There are currently no recreational projects planned for this area, other than those proposed in these alternatives, for the next 15 years. Recreational use of the area is expected to increase over the foreseeable future, including increased mountain biking and hiking. Overall, negative cumulative effects to fisheries and aquatic habitats are expected to be minimal, with beneficial effects occurring under all of the action alternatives.

Wildlife

Issues related to Wildlife:

- *Effects on wildlife habitat, species and individuals within the area.*

Introduction

The direction of the National Forest Management Act is to manage habitat to maintain viable populations of existing native and desired non-native vertebrate species (36 CFR 219.19). Through field reconnaissance and literature review (DeGraaf and Yamasaki 2001) it is known that a wide array of wildlife species inhabit the White Mountain National Forest throughout all or part of the year. The species on the Forest use a variety of habitat types and age classes to meet their needs. In forested habitat, approximately 70 percent of the species use mature and over-mature habitats, while 66 percent use early successional habitats for all or part of their life cycle (DeGraaf and Yamasaki 2001; DeGraaf et al. 1992).

Management for wildlife species diversity can be achieved by providing a broad spectrum of habitat conditions. To meet the goals of the National

Forest Management Act, the WMNF developed a wildlife strategy based on Habitat Management Units (HMUs) to provide necessary habitat diversity to maintain wildlife populations on the Forest (USFS, WMNF Forest Plan, pp 1-20 to 1-21). These habitat conditions include a variety of stand types and age classes, some requiring intervention in the form of vegetation management.

Vegetative management is prescribed to achieve HMU objectives (USFS Forest Plan 2005) and includes even-aged regeneration clearcutting and shelterwood prescriptions, and uneven-aged single tree selection and group selection prescriptions. Each of these is prescribed for units based on their stand type, ecological land type, age class, and condition. Clearcut units were prescribed by a Certified Silviculturist and are in mature hardwood stands where clearcutting is the optimum method to regenerate the stand. Clearcutting is proposed for the Than Project where it is the required method of creating early-successional habitat openings to achieve wildlife habitat objectives in these HMUs (NFMA 16 USC Section 1604(g)).

Group selection and single tree selection in mixedwood stands in these HMUs is prescribed to enhance softwood development. These treatments reduce competing hardwood overstory and provide an opportunity for co-dominant and suppressed or younger (naturally regenerating) softwoods to thrive and become a greater component in the stand. Some uneven-aged harvest may enhance vegetative and structural diversity.

Thinning a stand reduces stand density to improve growth, enhance forest health, or recover potential mortality. Thinnings do not change overall stand characteristics or negatively impact habitat quality, and do not change stand type from a wildlife habitat perspective.

An HMU is a block of land in which habitat composition and age class objectives will be established to help ensure that habitats are well distributed across the Forest and provide a framework for analyzing project impacts to wildlife habitat at a local scale (USFS 2006, 2006a). Blocks vary in size from about 6,000 to 49,000 acres, and contain a variety of habitat types and land in a mix of management areas.

The management of HMUs involves two major habitat parameters: the spatial distribution of community or vegetative types over the landscape and the relative proportions of successional stages, or age classes, within the vegetative or community types. Changes in community types occur either through natural succession over a long period of time or through stand-altering actions that may be either natural or human-created. This understanding provides the foundation from which the Forest can work toward achieving the desired conditions within each HMU.

Affected Environment

The Than project lies at the upper headwaters of the Wildcat River watershed and a portion of the upper Ellis River watershed. It covers all of the Wildcat HMU and a portion of the Ellis River HMU. HMU boundaries were altered during recent Forest Plan revision, which is why this project overlaps two HMUs. The Wildcat River HMU contains the bulk of the proposed actions.

Northern hardwood forests and a large portion of mixedwood forests characterize this HMU. There are two areas of paper birch, one of which is quite old.

Wildcat River HMU

The Wildcat River HMU contains the headwaters of the Wildcat River and some named tributaries, several of which are included in the Wild and Scenic River designation. The streams appear to have stable channels for the most part, however there is a lack of large woody debris that is often what causes scouring, creating pools and diversity of habitat.

There are no large bodies of water in the HMU. There is a marshy area at the head of Marsh Brook and another located near harvest unit 11. No vernal pools were observed during field excursions, however vernal pools may exist in areas of the HMU.

Several hiking trails cross the Project Area, and Jackson Ski Touring maintains Nordic trails in the area. No designated snowmobile trails exist in the Project Area.

Prospect Farm is owned by the Town of Jackson and is managed as a town forest. This historic, 500-acre farm returned to a forested habitat about 40 years old. No logging has occurred in the recent past (2004 personal communication, Art Fernald, Jackson), but some thinning treatments are planned for the next decade in portions of the area.

Ellis River HMU

All harvest units west of the Halls Ledge Trail lie in the Ellis River HMU. This HMU contains much of the Popple Project analysis area. The HMUs were revised during Forest Plan revision. The portion of what is now the Ellis River HMU that lies east of Rt 16 and the Ellis River is the portion in both Popple and Than Projects. For the purposes of analyzing cumulative effects for this project, the Popple Project will be considered as implemented.

The HMU as a whole now contains a diversity of forest types and age classes from implementation of the Popple Project in the west portion of the HMU. The east portion of the HMU contains primarily hardwood and mixedwood, with no regeneration-age habitat. Past harvests have provided some young stands of northern hardwoods throughout the HMU.

There is evidence of past beaver presence in the area along a few unnamed tributaries to the Ellis River. No large bodies of water exist.

The Analysis Area for direct and indirect effects on wildlife habitat is the 4,999 acres of managed lands (MA 2.1) of the Wildcat River HMU and the 7,165 acres of managed lands of the Ellis River HMU. This is the portion of the HMUs in which habitat objectives have been established in the Forest Plan.

The Analysis Area for cumulative effects to wildlife habitat includes all lands (9,474 acres in the Wildcat River HMU and 16,250 acres in the Ellis River HMU) as well as the private lands within or adjacent to the Project Area. An HMU is a building block for the larger wildlife habitat

management goals of the 2005 Forest Plan. When vegetative management activities fall within the desired future condition (DFC) for a given HMU, the cumulative effect is that the given HMU contributes to the larger wildlife habitat goals for the National Forest. Non-managed National Forest lands within the HMU boundaries, and private lands adjacent to the HMU, are considered when analyzing cumulative effects to determine if natural events or activities are taking place on private land within the HMU that may affect wildlife habitat. The temporal scope for considering cumulative effects on wildlife habitat is 10 years in the past and 10 years in the future. This time period was chosen because the benefits of regenerating stands diminish after 10 years for some wildlife species.

Direct and Indirect Effects on Wildlife Habitat

Alternative 1: No Action

Proposed actions for timber, recreation, wildlife, watershed, and invasive species management would not occur at this time. Openings in the forest canopy for the immediate future would result from mortality of individual trees or disturbance from some other natural event (storm, fire, infestation, etc.).

Direct Effects of No Action

Alternative 1 would cause no direct effects of tree removal or compaction of snow or soil substrates or noise from vegetation management activity. Therefore, there would be no direct effects of temporary displacement or interruption of established territories or travel patterns of wildlife species to, from, or within the proposed Than Project Area from vegetation, recreational, wildlife, watershed, or invasive species management activities.

Changes in the existing condition of vegetation community type or age class composition would occur through the natural process of forest succession or large-scale disturbances (fire, hurricane, ice storm, drought, or insect and disease infestations). The No Action alternative would perpetuate a mature to old forested habitat condition. Conversion of mixedwood habitat to softwood habitat would occur naturally. Forest interior species such as the ovenbird and wood thrush, and species preferring mature closed-canopy and climax forest conditions, would benefit from the perpetuation of the mature northern hardwood community type. However, the No Action alternative does not meet the Purpose and Need. This alternative would not move the forest towards the desired condition of either HMU for the northern hardwood regeneration age class; increase the amount of spruce-fir; paper birch, or aspen community types; nor provide wildlife habitat diversity in managed lands identified in the Forest Plan (USFS, WMNF Forest Plan, pp 1-20 to 1-21).

Indirect Effects of No Action

The No Action alternative would result in continued adverse indirect effect due to declining habitat diversity in the early-successional age class and in

the aspen-birch community types. This alternative would not provide an opportunity to increase the amount of early-successional (0 to 9 year old regeneration age-class) or next successional young-aged hardwood type required by various species.

The No Action alternative, over time, increases the amount of mature and old age class which creates greater potential for accumulation of downed woody material and large diameter cavity trees. However, Alternative 1 would not provide an opportunity via harvest treatments to maintain the aspen-birch component or pin cherry, raspberries, and other mast producing vegetation associated with clearcuts. Over time, the loss of aspen-birch would cause long-term, adverse indirect effects on several species including broad-winged hawk and ruffed grouse (Management Indicator Species; MIS) associated with these community types, and cause a potential decline in the diversity of wildlife favoring early-successional habitat, such as white-tailed deer and several neo-tropical migratory song birds in the project area.

There would be a lost opportunity to stimulate hardwood regeneration or increase available browse adjacent to mixedwood or softwood stands, as recommended for moose and white-tailed deer habitat management (Reay et al. 1990). The No Action alternative would cause an adverse indirect effect on the mourning warbler and chestnut-sided warbler, representative of early successional and young age class (sapling) in the northern hardwood community type. Alternative 1 allows the softwood spruce-fir component to increase over time as the aspen-birch forest type declines. Without a natural disturbance, softwood regeneration would not be accelerated.

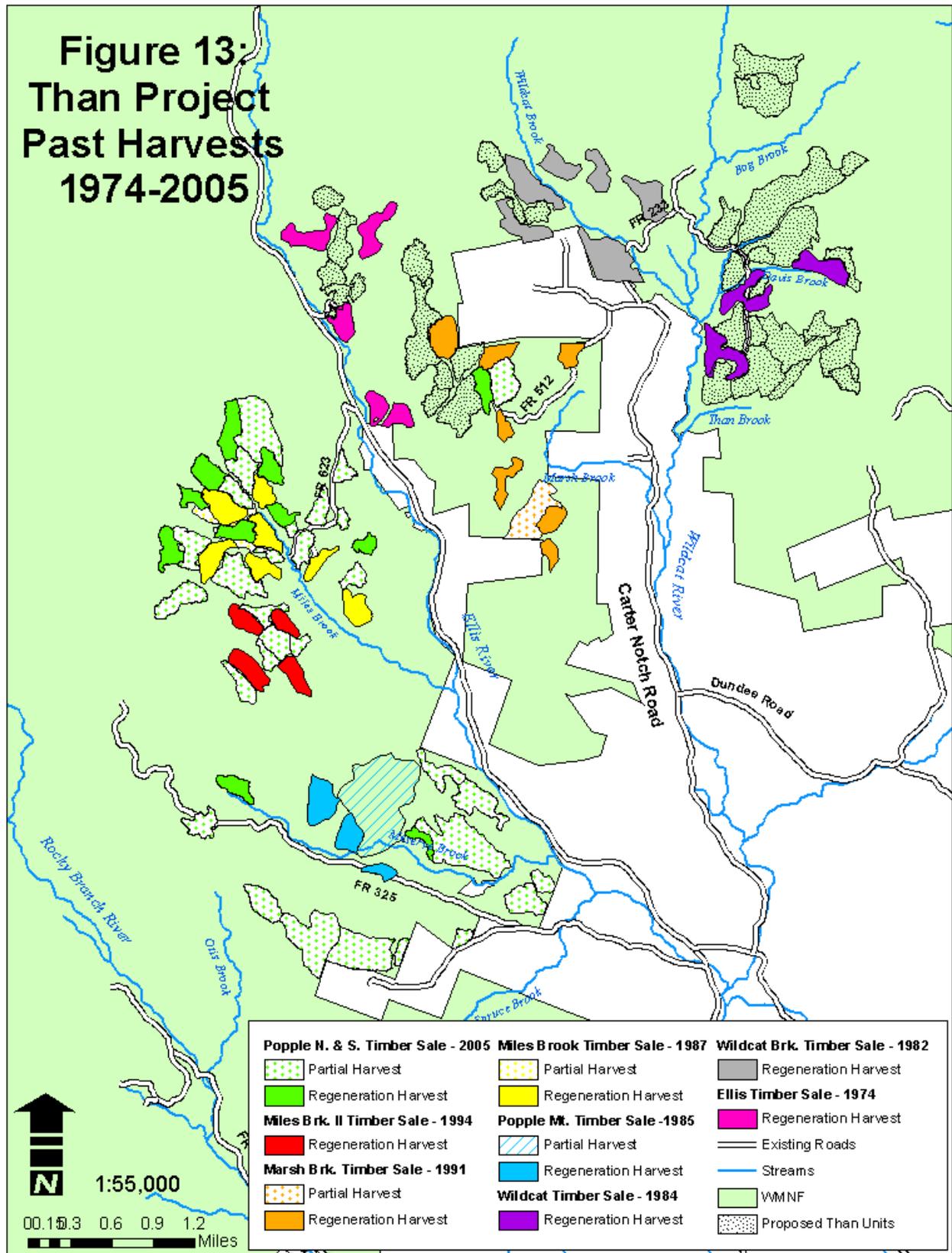
Indirect effects over time would include declines in habitat diversity (Trani et al. 2001), and some wildlife species would not find suitable habitat within the project area. It is expected there would be a potential decline in overall diversity via loss of vegetation age class and type and associated wildlife in the Than project area.

This alternative would retain existing mature northern hardwood habitat for species such as scarlet tanagers (MIS for mature/old northern hardwoods). Marginal habitat for blackburnian warblers (MIS for mature/old softwood habitat) would continue to exist as a majority of the stands currently have a mix of northern hardwood and softwood species. Habitat for species that prefer regeneration-age habitat such as chestnut-sided warblers (MIS for regeneration-age northern hardwoods) would not be present unless natural disturbance occurs. The majority of aspen and birch currently in the project area is old. This alternative would not create regeneration of this species and so it would continue to decline as a habitat type. Ruffed grouse (MIS for all ages of aspen-birch) would be expected to decline in numbers in this area due to the decrease of aspen-birch.

Cumulative Effects of No Action Alternative

The cumulative affects analysis area and time frame for wildlife habitat is described above under *Affected Environment*. This is the same for all alternatives. Desired habitat goals for wildlife are based on the HMU with adjustments based on Ecological Land Types (ELTs) and have the goal of

**Figure 13:
Than Project
Past Harvests
1974-2005**



providing a diversity of habitat conditions for wildlife species that inhabit the Forest (USFS, WMNF Forest Plan, pp 1-20 to 1-21).

Timber management activities from the 1950s to the present led to the construction of the existing road system. The Marsh Brook area of the Wildcat River HMU had a timber sale in 1996. All regeneration-age habitat created from that sale has moved into the young-age class. No timber harvest has occurred in the upper Wildcat River drainage (off FR 233) since 1987 because the Wild and Scenic Management Plan had to be written and designated prior to harvest. Harvest had occurred prior to 1987 and is the cause for the young-age stands in the HMU. A portion of what is now the Wildcat River HMU was in the HMU for the Popple Project prior to the signing of the 2005 Forest Plan. Two harvest units were prescribed within what is now the Wildcat River HMU. One unit is a commercial thin that would not alter the HMU and the other is a 19-acre clearcut. This unit has not yet been harvested, but is considered so for this analysis.

The Ellis River HMU just had the Popple Project analyzed in 2004. Harvest units from this project are being considered as implemented to account for cumulative effects. The Ellis River HMU had harvest in the late 1980s and again in the mid 1990s. Regeneration acres exist on the west side of the Ellis River; however, no regeneration-age habitat exists west of the Ellis River in this HMU. Currently the Ellis River HMU contains 188 acres of hardwood regeneration-age habitat and 80 acres of aspen-birch regeneration-age habitat. In the year 2007, 56 acres of the existing hardwood regeneration would move into the young age class, leaving 132 acres existing in this age class.

This alternative would add an adverse cumulative effect to the steadily declining trend in early-successional, regeneration-age class of northern hardwoods and aspen-birch community types within the Project Area and at the larger HMU, Forest-wide, and New England regional scales. Because of a decline in early-successional habitat, Neotropical migrant birds such as the chestnut-sided and mourning warblers, eastern kingbird and bluebird that rely on early-successional age class and/or aspen-birch community type (MIS ruffed grouse) would potentially decline within the Than Project Area. Overall, wildlife habitat and species biodiversity within the Than Project Area would decline (NHFG 1996). Numbers of individuals of a species may fluctuate in the project area; however, no population is expected to change to the extent the population trend of that species would be altered within its range. At the landscape scale, this alternative would add to the cumulative effects of a maturing forest, which is steadily increasing over the past several decades across the White Mountain National Forest, as well as across New England forested landscapes (USDA-FS 1993).

This alternative would maintain habitat conditions for approximately 175 wildlife species associated with mature northern hardwood or mixedwood habitats, approximately 125 wildlife species associated with mature softwoods habitat, and approximately 135 species that associate with shrubby upland openings (DeGraaf et al. 1992). Species relying on regeneration-age habitat would continue to find some suitable habitat on adjacent private lands for the next several years.

This alternative does not preclude future options for creating early successional habitat or diversifying community types through future stand entries to change stand structure and age class distribution. However, the ability to meet the Habitat Management Goals outlined in the Forest Plan in the reasonably foreseeable future for age class and habitat is somewhat uncertain. For age class diversity the ten-year monitoring summary indicates the Forest fell below desired levels for the regeneration age class while exceeding overmature age class for all habitat types within MA 2.1 and MA 3.1 (USFS 1996). The annual amount of clearcutting (the primary management tool used to create northern hardwood regeneration) has declined from 3,308 acres in 1970 to 242 acres in 2000 (USFS 2003). For habitat diversity, the Forest continues to have far more acres of northern hardwood community type than desired and less of all other community types, such as spruce-fir and hemlock (USFS 1996). The 2005 Forest Plan states there is a priority to retain existing aspen-birch and to regenerate any stands in the old age class.

Other past and present actions in this HMU include human use, such as Nordic skiing, hiking, camping, snowshoeing, and hunting. Human use appears to be moderate in this HMU during the snow-free seasons and high during winter due to the existence of Jackson Ski Touring Foundation's trails. Expectations are winter use would continue to be high and may increase.

**Alternative 2:
Proposed Action**

Alternative 2 proposes 173 acres of clearcut, 319 acres of commercial thinning, 8 acres of shelterwood harvest, 384 acres of group/single tree selection, and 45 acres of single-tree selection. An old, dilapidated, and unsafe camp acquired by the WMNF many years ago would be removed and the site revegetated.

Watershed improvements would occur on the headwater streams (total of approximately 6 miles) of the Wildcat River watershed. Wildcat Brook, Wildcat River, Bog Brook and Davis Brook all lack pools, sinuosity and cover. These streams appear stable although there may be small areas of eroding banks. Past management has led to few large logs in the stream or riparian area.

The proposal is to add up to 300 pieces of wood per mile. This is consistent with the Wildcat Wild and Scenic River designation. Instream wood increases habitat diversity by providing cover, increases scouring that forms pools for habitat during winter and drought, and collects debris that would increase nutrient levels (Likens and Bilby 1982). The wood would be placed and anchored using natural barriers and forms within the stream. The wood may relocate during periods of high flow, but is expected to settle out where natural processes would allow for the most benefits. Additional wood would decrease the velocity of water moving through the system and increase sediment deposition in the form of point bars and spawning gravels. Implementation would be done by hand tools and hand winches. This work would be done in stages over several years.

This alternative would create a parking area for Bog Brook trailhead along NFSR 233, and construct a short new section of trail to rejoin the existing trail. Direct impacts of this would be similar to those described under road construction.

This proposal includes a relocation of a section of the Wildcat River Trail. The section is located north of NFSR 233 for approximately 500 feet to where the trail comes very close to the Brook. There is evidence of the brook flowing down the trail during high rain events. Relocating the trail away from the brook to higher ground and rehabilitating the current trail would eliminate ongoing resource damage.

Direct Effects of the Proposed Action

Timber Harvest

Active timber harvest operations and connected actions, such as road construction or restoration, increases short-term human access to the Project Area. When operations are active, negative effects could include displacing wildlife, including nesting birds, or altering travel corridors or mobility of some species, including amphibians and small and large mammals. Beneficial effects of harvesting could include increased mobility for some species on snow compacted by skidder traffic, and additional browse for wildlife from residual treetops scattered on the ground.

Alternative 2 proposes 173 acres of clearcuts that would create regeneration-age openings for ten years. Removal of the trees would have direct effects to species living within them. Species desiring mature forest characteristics would be displaced to adjacent stands. Site conditions on the forest floor of clearcuts would be hotter and drier for 2 to 5 years after cutting, with increased decomposition of leaf litter (Fay et al. 1994). This could adversely affect some amphibians, such as the red-backed salamander (DeMaynadier and Hunter 1998). Individual salamanders in large unshaded openings would not likely survive. Species viability as a whole, however, would not be influenced. Amphibians and small mammals in clearcuts also might be more vulnerable to predation. This would be partially mitigated by leaving reserve patches of trees (Forest Plan: Wildlife Reserve Trees S-1).

Alternative 2 would cause the direct effect of an increase in the amount of limbs and tops on the ground from harvested trees, which would provide a localized, short-term source of natural browse for white-tailed deer when they need it most for overwinter survival. Mobility patterns of large mammals traveling to, from, or within the project area after harvesting activity would not be adversely affected by the proposed treatments or any road reconstruction or skid trails. Skid trails and forest roads provide packed snow trails for animals such a bobcat, fisher, and coyote to move along while foraging. Large mammals, such as moose and white-tailed deer, have large home ranges and appear to adjust quickly to displacement from harvesting activity, and may adjust their foraging behavior from day to night to avoid harvesting activity. Noise from logging equipment may cause a direct effect of displacing white-tailed deer to other areas during the day, but they return at night to feed on downed treetops.

Regeneration-age habitat would have beneficial effects on species such as ruffed grouse, snowshoe hare, deer, moose, chestnut-sided warblers, mourning warblers, and all other wildlife that utilize regeneration-age habitat (Trani et al. 2001; Conner and Adkinsson 1975; Dale et al. 1995; DeGraaf 1992; Thompson et al. 1992).

Commercial thinning does not alter the HMU habitat types. Group selection and single tree selection may ultimately and gradually change forest type. In the Than project, much of this harvest method is aimed at increasing the amount of softwood.

Pre-commercial thinning involves removal of small undesirable saplings or pole trees. This would not have any effect on species using the canopy layer. It may affect species that feed on woody browse. Targeted species may be preferred browse species or removal may allow preferred browse species or ground flora to flourish. The area affected would be relatively small on a landscape scale.

The season in which a unit is harvested may directly affect wildlife, especially during critical times of the species' life cycle. Breeding, young rearing, feeding, and winter survival are common critical times for most species. Individuals could be displaced, harassed or mortally affected during any season of operation. Summer harvest (June through August) could affect species that use trees for nesting, cover, and foraging (such as breeding birds) and ground dwelling species (mammals, amphibians, and reptiles). Fall harvest (September through November) would affect fewer nesting species but potentially could affect autumn breeding species including some amphibians, mast feeding species such as black bear, and small ground-dwelling mammals. Certain species such as owls that breed in winter could be affected during this time (December through March). Species that use cavities, such as chickadees and nuthatches, or species that den, such as squirrels, fisher, raccoons, and bear, could be affected if roost or cavity trees were harvested. Expectation is that no species would be affected to the point that its viability would become a concern.

Roads

Construction of new roads and reconstruction of existing roads may directly impact ground-dwelling species. New road construction (500 feet) would require removal of trees and ground disturbance. This may directly affect or kill individuals such as salamanders and small mammals. Larger animals have the ability to escape from the immediate area. No species would be affected to the point its viability becomes a concern, though individuals of a species may perish.

Trail Relocation and Parking Lot Construction

Relocation of a 500-foot section of Wildcat River Trail would reduce erosion presently occurring during high flows. Relocation of the trail would require some cutting of trees, waterbarring, and rehabilitation of the abandoned section of trail. Wildlife dwelling within this relatively small area may be impacted by these activities similarly to that of road building. Larger species would not be greatly effected by this action.

Creation of a parking area along NFSR 233 would have similar wildlife effect as road construction and may result in direct effects on individuals where soil is disturbed or trees cut.

Aquatic Work in Streams of the Wildcat River Watershed

Harvest of individual trees to place in the streams or riparian areas would have similar effects to that described under timber harvesting. Some trees would come from within the 25 foot riparian buffer zone but trees would be selected to reduce sedimentation, preserve bank stability and maintain a contiguous forest canopy.

Placing large wood directly in the stream would have a direct effect on aquatic organisms dwelling at these sites. Individuals may be crushed or injured. Some sediment may be created during implementation. Experience from former projects indicate this would be a minor amount and only for a short duration (Milot, personal communication). This work is compatible with the Wildcat Wild and Scenic River management plan.

Indirect Effects of Creating Northern Hardwood Regeneration

Alternative 2 proposes to create 173 acres of northern hardwood regeneration. The Wildcat River HMU would receive 102 acres of the hardwood regeneration. The Ellis River HMU would gain 71 acres of hardwood regeneration.. This would benefit species such as chestnut-sided warblers (MIS), fox, and moose that are associated with shrub layers, herbaceous ground vegetation, soft mast, and minimal overstory components. Up to 150 species use northern hardwood regeneration habitat for all or part of their life cycle (DeGraaf et al. 1992, DeGraaf and Yamasaki 2001). Recent studies indicate some mature forest species also benefit from regeneration-age habitat in that juveniles of mature forest birds have been found foraging in clearcuts prior to migrating south (Vitz and Rodewald 2005; King unpublished data. 2005). Numbers of individuals of any species may fluctuate in the project area due to implementation of this alternative, however no population is expected to change to the extent the population trend of that species would change within its range.

The stand of old paper birch is not being proposed for harvest at this time due to the thick understory of softwood. Further analysis will be done to determine if this stand should be harvested to retain paper birch in this area. Retention of paper birch would benefit ruffed grouse, MIS for this habitat type. Without any harvest this stand will convert to softwood habitat as the paper birch dies out. This would benefit species that utilize softwood habitat such as the magnolia warbler (MIS for regeneration-age softwoods) or snowshoe hare but would have a detrimental effect on species such as ruffed grouse and broad-winged hawks that prefer paper birch.

Indirect Effects of Even-aged Treatments on Mature Northern Hardwoods

Alternative 2 proposes 319 acres of commercial thinning (290 acres in the Wildcat HMU and 29 acres in the Ellis HMU). This maintains the mature character of the existing stands retaining interior forest characteristics for species such as ovenbirds or wood thrush (King 1993; MacFadden 2000;

Welsh 1992; Yamasaki et al. 2000). Some mature trees would be removed to allow the residual trees room to increase volume. There would be no conversion to other community types. Wildlife would experience minimum indirect effects in these units, but effects from some tree removal, skid roads, compaction and disturbance would occur. Habitat would be retained in all of these harvest units for scarlet tanager (MIS) with little to no effect on the population.

Effect of Timber Harvest on Dead and Down Wood

In proposed clearcuts there would be a lack of future large dead and down wood (>11" DBH) for up to 60 years. Residual trees in all other harvest units would continue to supply a component of standing and down woody material as trees die, branches break, and annual litter builds up on the ground. Forest Plan Standards and Guidelines would retain wildlife trees in harvest units for future large cavity trees and dead/down wood. This, in conjunction with the abundance of mature habitat within the managed and unmanaged portions of these HMUs, would ensure that an adequate amount of cavity trees and dead/down wood is available for wildlife associated with these habitat features.

Indirect Effects of Uneven-aged Treatments on Mixedwoods, Spruce-fir, and Hemlock

Tables 1a and 1b (Chapter 1) indicate an overabundance of existing mature and old mixedwood habitat with some overabundance of mature northern hardwood habitat. Spruce-fir is lacking. The objective as described in the Forest Plan is to convert some of the mixedwood acres to spruce-fir and some of the mature hardwood to regeneration-age to create a more diversified array of habitats. Pre-commercial thinning may be implemented to release desired regeneration once establishment occurs.

The 384 acres of proposed individual tree and group selection harvests (368 acres in the Wildcat HMU and 16 acres in the Ellis HMU) in mixedwood stands would maintain the mature character of the existing stands. The objective is to maintain canopy cover while scarifying soil in some areas along with increasing sunlight to the forest floor in order to enhance softwood regeneration. These stands currently have both northern hardwoods and softwoods. Under this harvest method the expectation is that red spruce, balsam fir, and hemlock would increase and the stands would eventually provide the softwood habitat desired by white-tailed deer for winter cover as well as the magnolia warbler (MIS for regenerating softwood habitat), along with many other species such as red squirrel and American marten. These treatments would remove some mature trees and release the understory to create more vertical structure and layers. This ultimately converts 364 acres in these HMUs from northern hardwood to softwood habitat with long-term benefits to species desiring mature softwood habitat such as Blackburnian warblers (MIS).

Compared to the No Action alternative, group selection harvest would remove small groups of trees, but overall retain a canopied, interior forest condition in the stand. This management system requires entries on a 15-

year average and results in a more frequent level of disturbance that may have impacts on individuals of ground-dwelling species. Tops left on the ground would provide immediate forage for browse-eating species while stump sprouting would provide browse for several years after harvest. This would also occur from any pre-commercial thinning that occurs following the harvest treatments.

Where group selection would occur, the area may become marginally suitable for species desiring regeneration-age habitat (Costello 1995; Kerpez 1994; DeGraaf and Healy 1988). The larger the group opening, the more suitable the area would be to species such as chestnut-sided warblers (MIS). Larger openings may also see an increase of shade intolerant species such as paper birch in the center of the group openings. This would not add to the desired regeneration age condition of the HMU, but may have a minor benefit to individuals of a species.

All of these treatments would create disturbance and open the canopy to partial sunlight. There would be minor changes to shading of the forest floor. The result would be to diversify stand structure and increased understory vegetation and browse availability for wildlife. Wildlife species preferring a closed canopy, dead trees, or softwood cover (DeGraaf et al. 1992) would expect to be favored by these treatments.

Alternative 2 moves in the direction of the desired condition by increasing the amount of softwood habitat, initiating northern hardwood regeneration, and reducing the amount of mature northern hardwood habitat.

Indirect Effects of Whole-Tree Harvesting

Whole-tree harvesting is the removal of branches and tops of trees in addition to the bole of the tree. It would reduce the one time input into organics at the site from most of the treetops and branches. Some species such as moose and white-tailed deer make use of this source of browse during the winter months. Existing dead and down woody material would remain after harvest with both conventional logging and with whole-tree harvesting. This would continue to provide habitat for species such as amphibians and small mammals. Thinned stands, reserve trees, and patches would continue to provide cover for small mammals and amphibians in units that allow whole-tree harvest. Whole-tree harvesting would not affect recruitment of large woody debris (see Fay et al. 1994 for an analysis of deadwood recruitment).

Indirect Effects of Roads

All main access roads would continue to be closed (gated) to public vehicular access, so Alternative 2 would not cause any increase in human disturbance to wildlife except during sale preparation and sale implementation. All classified roads necessary for the project are to receive reconstruction or maintenance. These roads may provide habitat for species like bats that use roads and trails as travel corridors. Northern goshawks have been known to nest adjacent to roads. System roads are maintained by brushing and grading. This may positively or negatively effect species utilizing the edges of the road, depending on the species.

Fragmentation

The public has previously indicated a concern regarding the creation of “edge” habitat and fragmentation as a result of even-age harvest methods. Clearcutting would create an edge along boundaries of the clear-cut units. Research has shown this edge is not present long in New England forests as the “edge” created is ephemeral, lasting only a few years until the clearcut attains some vertical height. No distinct bird communities are associated with these edges. (DeGraaf 1991).

Fragmentation occurs when large blocks of forested habitat are broken or separated by a different habitat type or age class. Species associated with mature interior forests such as wood thrush would be negatively impacted. The White Mountain National Forest and most surrounding private land is well-forested. Research has found no evidence of negative aspects of forest fragmentation exhibited in isolated forest environments in large forested areas where active timber harvesting occurs (Askins et al. 1990; Askins 1993; DeGraaf and Healy 1988; Thompson et al. 1992). The 2005 Forest Plan states that American marten will be used to evaluate effects on landscape-scale fragmentation (USFS 2005b). Marten are increasing in numbers on the WMNF (Kelly 2006; Staats 2005), which would indicate adverse effects of fragmentation are not occurring. Surveys for species that favor open conditions, such as brown-headed cowbirds, have shown this species is not dispersing into interior portions of the forest (Yamasaki et al. 2000) and none have been observed during project effectiveness monitoring on previous harvest areas (USFS 2006c, unpublished data). Less than half of the WMNF is open to timber harvesting. This project proposal maintains suitable habitat for forest interior wildlife species, such as the scarlet tanager (MIS), wood thrush, or ovenbird.

Indirect Effects of Aquatic Work in the Wildcat River Watershed

The proposed action is to restore the watershed to a more natural condition by increasing downed wood in the riparian areas and within the streams of the watershed. Adding wood to parts of the riparian area would slow water movement during high rain events, thereby decreasing potential erosion or formation of new channels in the area (Jeffries et al. 2002). Large wood in the riparian zone is also beneficial to terrestrial wildlife in that it provides denning areas and cover.

Trees for instream and riparian area structure would be specifically selected to improve the overall riparian corridor. Trees would come from within the riparian area or very near to it. Some species may be affected indirectly by the change of water flow during implementation. This would be of short duration and restricted to the immediate vicinity of the work site. Localized sedimentation may also occur. Monitoring of previous projects on the WMNF has shown sedimentation is localized and of short duration (USFS, monitoring data from Great Brook, unpublished). Sufficient woody debris in streams slows the rate of flow and results in less sediment moving through the system over time.

No species would be adversely impacted to the extent their viability would be a concern. Some species would see indirect improvements in habitat from increased cover debris, pool habitat, and increased nutrient levels.

An increase in the numbers of macroinvertebrate species in the stream is expected, and may lead to an increase of fish, salamanders, amphibians, etc. that in turn are prey for other animals.

Cumulative Effects on Wildlife Habitat under Alternative 2

The cumulative effects analysis area and temporal scope for wildlife habitat for the Than Project is described above under Affected Environment.

Alternative 2 would move towards the desired future condition for these Habitat Management Units as described in the Forest Plan (Chapter 1, p 21). This alternative adds to past harvest actions. It would benefit wildlife species requiring mature northern hardwoods, softwood cover, interior forest conditions, regeneration-age habitat, and permanent upland openings.

Initiating conversion of mixedwood stands to softwood stands would increase softwood habitat and benefit the blackburnian warbler (MIS) within the project area. Increasing the amount of softwoods is a Forest Plan objective, as soils on the Forest indicate there should be more softwood stands than currently exist. Regeneration-age habitat would be created, providing habitat for several neotropical migrant birds (chestnut-sided warbler; MIS) within the project area. No timber harvest other than the planned Popple Mt. harvest is planned for these HMUs in the foreseeable future. The Town of Jackson owns Prospect Farm, and foresters have indicated that the town is interested in conducting some harvest; however, it would most likely be a thinning or selective harvest method. If this is done, there would be no major change in habitat for wildlife species. While populations of species may change within the project area, this alternative of the Than project is not large enough to cause changes of population trends within the WMNF.

The aquatic and riparian stream enhancement project in the upper Wildcat watershed would combine with stream stabilization work planned for Meserve Brook under the Popple Project. These projects would cumulatively enhance stream and riparian conditions, increase stream diversity, and enhance the overall habitat condition of the Ellis and Wildcat watersheds. The work is proposed to be implemented in stages over the next 5 years, as this allows for monitoring and assessment of bank stability in each completed section of stream requiring rehabilitation or enhancement.

Other present uses in this HMU include Nordic skiing, hiking, camping, snowshoeing, and hunting. Human use is moderate in this HMU during the snow-free seasons and high during winter due to the existence of Jackson Ski Touring Foundation's numerous trails. Expectations are that both summer and winter use will continue to increase, with increased disturbance to resident wildlife.

Road reconstruction would have minor temporary impacts to ground dwelling species. Road improvements may contribute to higher bicycle and Nordic Skiing use of these roads (including pets). Nevertheless, the cumulative effects of this alternative would not adversely affect any species enough to result in a viability concern.

Alternative 3

This alternative restricts the season of harvest for units along NFSR 512 to summer and/or fall to minimize impacts to Nordic Skiing. It would remove the need to plow this road, leaving it open for Nordic skiing. Alternative 3 proposes the same types and acres of harvest as Alternative 2. This alternative also proposes a new Nordic Ski Trail.

Direct and Indirect Effects

Direct effects to wildlife from timber harvest, road reconstruction, new road construction, trail relocation, aquatic restoration, and pre-commercial thinning would be similar to that described for Alternative 2.

Indirect effects would be similar to those described in Alternative 2, with a few minor differences. Harvest operations in winter often provide easier access to a greater forage base for some species. Harvest equipment compacts snow and allows species such as deer, coyotes, fisher, etc. access to more areas during deep snow conditions. This is beneficial, as it gives these species a greater area in which to search for food. There is a negative effect on species such as snowshoe hare that are considered prey, as predators would have an advantage on compacted snow.

Deer and moose often browse on tops left behind in harvest units. This is often a benefit during winter when energy depletion of these animals is at its highest. There would be fewer tops available to browse on in winter under Alternative 3 than under Alternative 2.

Proposed New Ski Trail

Alternative 3 includes a proposal for a new Nordic ski trail from the end of FR 233 to connect to East Pasture trail. Total length is estimated at 2.0 miles of new trail construction.

Construction of this Nordic ski trail would be similar to building a road. The trail would be under the Jackson Ski Touring Foundation's permit and would most likely be wide enough for a groomer. On average, the trail would be about as wide as a haul road (16-22 feet).

Direct effects to wildlife would be similar to effects from new road construction. Trees would be removed; soil disturbed, re-contoured, and compacted; and drainages altered by culverts and ditches for the entire length of the proposed trail. Individuals of species dwelling within the proposed location could be directly affected if they did not vacate the area prior to implementation. There is an expected increase of human presence in an area that has not had much human presence that may cause some species may flee the area. Permanent culverts and ditching would be required where needed. The proposed location is on relatively steep ground, requiring many switchbacks, resulting in more ground area disturbance in length as well as width, as "cut and fill" techniques would be necessary.

Direct effects may also occur after implementation when the trail is brushed to remove vegetation, typically done annually in the fall. The mower may injure or kill individuals. Conversion of the area to grass and forbs would benefit species that utilize this habitat type and be detrimental to species

that prefer shrub/tree vegetation. Species would be indirectly affected by the change from forested to grass/forb habitat. Species that desire grass/forb habitat would benefit, though in a minor way because of the linear nature of the trail.

American marten are well adapted to deep snow conditions because their large feet allows them to cruise on top of snow. This gives them an advantage over species such as fisher, bobcat, and coyote that flounder in deep snow. Providing access to bobcat, fisher, and coyote via a packed trail eliminates the hunting advantage marten have over these species (Kelly 2006). Marten also prefer low human presence and low road densities, and were selected to evaluate forest fragmentation in the WMNF over this next planning period (USFS 2005). While the purpose is a Nordic trail, expectations are that use of this new trail for hiking and mountain biking would occur as well. Therefore, human presence in the area would be expected to increase for $\frac{3}{4}$ of the year (excluding mud season). This may have a negative effect on marten as well as other species that seek solitude from humans.

The proposed location for this trail, while primarily in hardwood stands, is within close proximity to softwood or stands that are currently mixedwood but expected to become softwood naturally or through management actions. Field visits have indicated the area has greater potential for suitable lynx habitat than is currently indicated on the lynx habitat map. (See the Biological Evaluation for effects to Canada lynx habitat.)

Indirect Effects of Aquatic Work in Headwaters of Wildcat River, Wildcat Brook, Bog Brook, and Davis Brook

This would be similar to the discussion under Alternative 2.

Indirect Effects of Roads

This would be similar to the discussion under Alternative 2.

Cumulative Effects on Wildlife Habitat under Alternative 3

Alternative 3 has similar cumulative effects as Alternative 2 for timber harvest, trail relocation, parking lot construction, and aquatic restoration. This alternative adds to past harvest actions. It would benefit wildlife species requiring mature northern hardwoods, softwood cover, interior forest conditions, regeneration-age habitat, and permanent upland openings.

The spatial analysis for cumulative effects on wildlife from creation of a new Nordic ski trail is the same as for other wildlife effects described for the No Action alternative because Wildcat River and Ellis River HMUs cover the bulk of Jackson Ski Touring Foundation's trails located on the White Mountain National Forest. The time period is 10 years in the past and 10 years in the future. Ten years is a realistic time to project future actions in the area.

The section of the Wildcat River HMU where proposed actions would occur under Alternative 3 has been relatively void of human presence since the last harvest in the 1980s. A few small timber sales occurred in Wildcat HMU before 1980, but were limited in area and were generally thinning

of younger stands. Few to no old logging roads exist. Creation of a groomable Nordic trail would impact those wildlife species that prefer seclusion. The probability is high that human presence would increase greatly with the addition of a groomed Nordic ski trail. In addition, hikers and bikers would most likely use this trail in the snow-free periods. This would expand the time of human presence in the area to approximately $\frac{3}{4}$ of the year. In addition, compaction of the snow surface in winter would give easy access to wildlife species that compete with American marten for prey. This may alter the mix of wildlife species from those that avoid human presence and prefer deep snow conditions to species that co-habitat better with humans and function better at lower elevations due to snow depths.

Alternative 3 would move towards the desired future condition for these Habitat Management Units (HMUs) as described in the Forest Plan (Chapter 1, p 21) by adding to past harvest actions. It would convert mixedwood stands to softwood stands, implement aquatic and riparian stream enhancements, and would benefit wildlife species requiring mature northern hardwoods, softwood cover, interior forest conditions, regeneration-age habitat, and a permanent upland opening.

Road improvements may contribute to higher bicycle and Nordic skiing use of these roads (including pets). Nevertheless, the cumulative effects of this alternative would not adversely affect any species enough to present a viability concern forest-wide.

Alternative 4

Direct and Indirect Effects of Alternative 4

Trees would be harvested under Alternative 4 with 217 acres of clearcut, 269 acres of commercial thinning, 14 acres of shelterwood harvest, 384 acres of group/single-tree selection, and 45 acres of single-tree selection.

Direct Effects to Wildlife from Timber Harvest

This alternative increases the amount of clearcut harvest proposed in Alternatives 2 or 3. Overall direct effects would be relatively similar to those of Alternatives 2 or 3.

Indirect Effects to Wildlife from Timber Harvest

This alternative would have a more adverse affect on species that prefer mature forested habitat due to the increased clearcut acres, but would create more regeneration-age habitat for species that prefer or use this habitat type. The increased acres of regeneration habitat this alternative provides over Alternatives 2 or 3 is not significant when examined at the landscape scale. This alternative moves the same amount of mixedwood habitat to softwood, and would therefore have similar effects as described in Alternatives 2 and 3.

Indirect Effects of Roads

Alternative 4 proposes 200 feet of new road construction compared to 500 feet in either Alternative 2 or 3, and may therefore have fewer direct and indirect effects as described under Alternative 2 on wildlife. Under this

alternative there would be more skid roads to make up the difference, and effects would therefore depend on site-specific issues such as slope, soils, weather, etc.

Effects of Other Proposed Actions

For the remaining proposed actions (trail relocations, watershed enhancement work, parking area creation, pre-commercial thinning) direct and indirect effects would be similar to those described under Alternative 2. The creation of a new Nordic ski trail would have similar effects to those described under Alternative 3.

Cumulative Effects on Wildlife Habitat under Alternative 4

Alternative 4 has cumulative effects similar to Alternative 2 for trail relocation, parking lot construction, pre-commercial thinning and aquatic restoration. This alternative proposes 44 additional acres of clearcut harvest compared to Alternatives 2 or 3, and 157 more acres than Alternative 5. The increased amount of early-successional habitat would better meet Forest Plan objectives for wildlife habitat. This alternative adds to past harvest actions and would benefit wildlife species requiring mature northern hardwoods, softwood cover, interior forest conditions, and regeneration-age habitat. At this time it is expected that there will be some harvest activity in Prospect Farm over the next ten years, but indications are it would not include clearcuts or convert stands to another forest type. This alternative would have similar cumulative effects regarding the new Nordic ski trail to those described under Alternative 3.

No species is expected to have a viability concern with implementation of this alternative.

Alternative 5

This alternative responds to public issue regarding management activities within the 2004 Inventoried Roadless Area by deferring all stand treatments in units within the IRA. This alternative also eliminates all watershed restoration within Wildcat River, Wildcat Brook, and Bog Brook. Davis Brook lies outside of the inventoried roadless area and would include one mile of watershed restoration under this alternative.

Direct and Indirect Effects

Direct Effects to Wildlife from Timber Harvest

The elimination of over 17 units from this alternative would prevent all harvest in the Ellis River HMU. Direct and Indirect Effects for this HMU under this alternative would be the same as that of the No Action alternative.

Direct Effects to wildlife in the Wildcat River HMU under this alternative would be similar to those described for Alternative 2; however, they would occur on fewer acres.

Indirect Effects to Wildlife from Timber Harvest

Alternative 5 proposes 60 acres of clearcut, 239 acres of commercial thinning, 8 acres of shelterwood harvest, 110 acres of group/single-tree

selection, and 45 acres of single-tree selection.

Treated areas would not be well distributed throughout the HMU because this alternative does not treat any units in the IRA, an area covering the north half of the HMU.

This alternative retains more mature habitat for species such as scarlet tanager (MIS) that prefer this age class. Chestnut-sided warblers (MIS), however, would not find as much regeneration-age habitat as under Alternatives 2, 3, or 4.

Alternative 5 forecloses on the opportunity to accelerate the conversion of up to 254 acres of mixedwood habitat to softwood habitat for species such as blackburnian warblers (MIS). This alternative defers on the opportunity to create up to 157 acres of regeneration habitat that would be created under Alternative 4, or 113 potential acres under Alternatives 2 or 3. This reduction in potential habitat diversity would substantially reduce this project's ability to meet Forest Plan goals for wildlife habitat. These effects are long-lasting, particularly because failure to create early successional habitat now also results in elimination of the next successional age class (young age) on these acres throughout the next six decades.

Indirect Effects of Roads

Alternative 5 omits two short sections of road reconstruction, to units 18-20, and the bridge and associated road reconstruction across the Ellis River (units 29-33). Therefore, there would be no direct or indirect effects from either the bridge installation or these roads. NFSR 233 would still have pre-haul maintenance and road re-construction, and FR 512 would still be upgraded to a three-season road. Effects would be similar to those discussed under Alternative 2.

Indirect Effects of Aquatic Work in Davis Brook

Under Alternative 5, only Davis Brook would receive watershed restoration work. Trees would be cut and placed in approximately one mile of Davis Brook to increase the structure and diversity of habitat within the stream. Riparian areas having side-channels or braided sections would also have logs added to the forest floor. Effects would be similar to those described under Alternative 2.

For the Wildcat River, Wildcat Brook, and Bog Brook, no restoration would occur. Natural processes of trees falling into the streams would still occur; however, attainment of stream conditions similar to those present prior to human influence — including pool and cover habitat, woody habitat for macroinvertebrates, and increased nutrient levels — are probably several hundred years in the future under this alternative.

Effects of Proposed Connected Actions

For the remaining proposed actions (trail relocations, parking area creation, pre-commercial thinning) direct and indirect effects would be similar to those described under Alternative 2.

Cumulative Effects on Wildlife Habitat of Alternative 5

Alternative 5 has cumulative effects similar to Alternative 2 for trail relocation, parking lot construction, and pre-commercial thinning. This alternative treats fewer acres, and therefore cumulatively reduces this project's ability to meet Forest Plan goals for wildlife habitat now and into the future. The alternative adds cumulatively to past harvest actions within the HMU, but not to the degree of Alternatives 2, 3, or 4. This alternative would benefit wildlife species requiring mature northern hardwoods and interior forest conditions. There are some benefits to species preferring regeneration-age habitat, but to a much lesser degree than under Alternatives 2, 3, or 4. At this time, it is expected there would be some harvest activity in Prospect Farm over the next ten years, but indications are it would not include clearcut harvest methods.

Davis Brook would attain conditions similar to what existed prior to human influence; however, Wildcat Brook, Wildcat River, and Bog Brook would attain these conditions slowly over the next several hundred years.

No species is expected to have a viability concern with implementation of this alternative.

Summary Comparison of Cumulative Effect on Wildlife Habitat Diversity

The No Action alternative allows for existing mature forests to continue with natural succession to climax forest types, but would not increase habitat diversity. The wildlife strategy under the Forest Plan is to provide a diversity of habitat types across the Forest. Under this premise, all of the action alternatives increase habitat diversity. Alternatives 2 and 3 are equal in the amount of habitat diversity created and the amount of watershed improvement projects. Mature habitat is retained, regeneration-age and opening habitat created, and softwood habitat enhanced. Alternative 5 creates the least amount of habitat diversity in regards to wildlife because of the reduced amount of areas harvested. This alternative also has the least amount of watershed improvement work proposed. Alternative 4 does all that Alternatives 2 and 3 do and allows for the greatest amount of habitat diversity. From a wildlife perspective, Alternative 4 comes closest to meeting Forest Plan direction.



A twenty year old clearcut well stocked with birch, maple and pin cherry regeneration.

Federal Threatened, Endangered & Proposed Species (TEPS), Regional Forester Sensitive Species (RFSS), and Rare Communities

Affected Environment for TEPS, RFSS and Rare Communities

A Biological Evaluation (BE) for Federally Threatened, Endangered, and Proposed (TEP), and Regional Forester Sensitive Species (RFSS) was completed on November 2, 2006 for all Alternatives proposed for the Than Project in the Wildcat River HMU and the Ellis River HMU (BE, Project Planning Record). The process used and the sources examined to determine potential occurrence of TEP or RFSS presence are listed in the Biological Evaluation (BE, located in the project record). The BE also details direct and indirect effects to these species.

Based on a pre-field review of all available information, it was the District Biologist's determination that potential habitat may occur within the Project Area for one Federally Endangered Species (Canada lynx), and six Regional Forester Sensitive Species (eastern small-footed myotis, northern bog lemming, Brown's Ameletus Mayfly, Third Ameletus Mayfly, Bailey's sedge, and Autumn coralroot). No rare communities exist within the Project Area.

The Analysis Area for direct and indirect effects to TEPS/RFSS is the Project Area, including stands proposed for treatment and the connected actions that facilitate treatment (roads, landings, etc.) along with the proposed trailhead parking, trail relocation, trail construction, watershed improvement, stand improvement, and wildlife opening creation. **The analysis area for cumulative effects** to TEPS/RFSS is the WMNF and the lands within the Wildcat River and Ellis River HMUs and adjacent private land abutting these areas. The temporal scale for these species is 10 years in the past and ten years in the future as the benefits of the regeneration age class for some wildlife species diminish after 10 years.

Effects Determination and Rationale For TEPS and RFSS

Federally Threatened, Endangered and Proposed Species (TEP)

Canada Lynx

There would be **no direct effect** to Canada lynx from any of the alternatives. Alternative 3 or 4 **may indirectly affect** Canada lynx habitat.

Rationale

- No Canada lynx or federally designated critical habitat exists within the Project Area therefore no direct effects would be anticipated in any alternative.
- Two Canada lynx tracks have been reported from the northern section of the WMNF: one on January 26, 2006 and one on March 21, 2006 (NHFG 2006). At this time these are the only two confirmed reports of lynx on the WMNF in the past several decades.
- USFWS is currently reviewing only projects that occur north of Rt. 2 in regards to Canada lynx.
- Communication between WMNF and USFWS is current and ongoing.

- Softwood habitat is maintained in Alternative 1 and enhanced under all Action Alternatives.
- Snowshoe hare foraging habitat is maintained in Alternative 1 and increased under all Action Alternatives.
- The proposed Nordic ski trail in Alternatives 3 and 4 lies in a portion of suitable lynx habitat. The intent of the guideline to maintain foraging habitat and the guideline to retain habitat connectivity (USFS 2005 Chapter 2 pg 16) are *not* met because the proposed trail fragments areas of suitable habitat and may allow competitive species into adjoining areas of lynx habitat. Although lynx may not currently be occupying the project area, this indirectly could result in a loss of suitable habitat for future recolonization.

Regional Forester Sensitive Species (RFSS)

Eastern Small-Footed Myotis (Bat)

In view of all the information available, it is my determination that the **No Action alternative would have no impact and that the Action Alternatives may impact individual eastern small-footed myotis but would not likely cause a trend toward federal listing or loss of viability.**

Rationale

- Most literature indicates that eastern small-footed myotis roost under rocks on hillsides and open ridges, in cracks and crevices in rocky outcrops and on talus slopes, as well as in buildings (Erdle and Hobson 2001). The likelihood that individual bats are roosting in trees in Project Area is considered fairly low.
- The amount of harvest proposed in this project and cumulatively across the forest would not alter suitable habitat enough to cause a noticeable change in small-footed bat populations.
- Forest Plan Standards and Guidelines (USFS 2005) provide direction to maintain a diversity of habitat conditions well distributed across the Forest, reserve large wildlife trees in areas managed for vegetation, retain standing dead trees where possible, and maintain riparian habitats. This would assure that adequate habitat is maintained for eastern small-footed myotis.

Northern Bog Lemming

Based on review of available information, it is my determination that the **No Action alternative would have no impact and that the Action Alternatives may impact individual northern bog lemmings but would not likely cause a trend toward federal listing or loss of viability.**

Rationale

- Northern bog lemmings are very rare in New England. The likelihood of an individual occurring in the Project Area is considered low.

- Identifiable wet seepy areas adjacent to streams are usually excluded from harvest units minimizing the risk of disturbing an individual animal or associated habitat.
- Forest Plan Standards and Guidelines maintain a diversity of habitats and protect riparian habitats (USFS 2005). These would minimize negative effects and provide adequate habitat for northern bog lemming.

Brown's
Ameletus Mayfly

Based on review of available information, it is my determination that the **No Action alternative and Alternative 5 would have no impact and Alternatives 2, 3, and 4 may impact individuals but would not likely cause a trend toward federal listing or loss of viability.**

Rationale

- This mayfly was collected in the very headwaters of the Ellis River above the project site.
- The site of the bridge crossing on the Ellis River has a width greater than 10 feet which is outside of the suitable size stream for this species.
- Forest plan standards and guidelines would protect streams during harvest activity, road construction and bridge installation from reducing the canopy cover, removing riparian vegetation, and causing sedimentation.
- Alternative 5 would have no bridge installed across the Ellis River and would therefore have no effect on this species.

Third Ameletus
Mayfly

Based on review of available information, it is my determination that the **No Action alternative and Alternative 5 would have no impact and Alternatives 2, 3, and 4 may impact individuals but would not likely cause a trend toward federal listing or loss of viability.**

Rationale

- This mayfly was collected in a tributary of the Peabody River. To date, no specimens have been recorded within the Than Project Area.
- The site of the bridge crossing on the Ellis River has suitable habitat.
- This species prefers erosional sites within streams.
- Alternative 5 would have no bridge installed across the Ellis River and would therefore have no effect on this species.
- Forest plan standards and guidelines would protect streams during harvest activity, road construction and bridge installation from reducing the canopy cover, removing riparian vegetation, and causing sedimentation.

Bailey's Sedge

Based on review of available information, it is my determination that the **No Action alternative would have no impact and all Action Alternatives may impact individual plants of Bailey's sedge but would not likely cause a trend toward federal listing or loss of viability.**

Rationale

- Bailey's sedge is on the northern edge of its range in New England and may be naturally rare here being suitable habitat appears plentiful.
- Identifiable wet seepy areas are usually excluded from harvest units minimizing the risk of disturbing individual plants or associated habitat.
- Forest Plan Standards and Guidelines maintain a diversity of habitats and protect wet areas (USFS 2005). Roadside ditches, log landings, and wildlife openings would continue to provide suitable habitat for this species even if harvest occurs.

Autumn coralroot

Based on review of available information, it is my determination that the **No Action alternative would have no impact and all Action Alternatives may impact individual plants of autumn coralroot but would not likely cause a trend toward federal listing or loss of viability.**

Rationale

- The southern edge of the WMNF is on the extreme northern edge of autumn coralroot's range and this project area lies approximately in the east central portion of the WMNF, perhaps outside of its range.
- Autumn coralroot can be found in a variety of forested upland habitats, though these woods are typically mesic and only occasionally dry.
- This species was recently discovered in a stand that had been harvested within the last 10 years on the southern edge of the White Mountain National Forest indicating selective harvest may not be a negative action.
- Forest Plan Standards and Guidelines maintain a diversity of habitats and protect wet areas (USFS 2005).

Wilderness and Roadless

Issues related to Wilderness and Roadless:

- *Effect that proposed actions would have on roadless and wilderness characteristics of the Wild River Inventoried Roadless Area.*

Introduction

Inventoried Roadless Areas (IRAs) are lands within a National Forest that meet the criteria found in Table 23. These criteria are the same as those found in FSH (Forest Service Handbook) 1909.12 that qualify areas for inventory as lands that may have potential for wilderness recommendation. This section of the FSH states: “National Forest System lands in the eastern United States have been acquired over time from private ownership. Criteria for inventorying roadless areas in the East recognize that much, if not all of the land, shows some signs of human activity and modification even though they have shown high recuperative capabilities.”

As part of the recently-completed 2005 Forest Plan process, the White Mountain National Forest was required to conduct an inventory of lands within the National Forest that qualify as roadless. This inventory reconsidered all lands on the National Forest for their roadless area potential, accounting for new land acquisitions, changes to the landscape since the last Forest Plan, and improved computer technology for evaluating areas.

The new inventory includes 27 Roadless Areas totaling over 403,000 acres. The complete Forest Roadless Area Inventory and Evaluation is in Appendix C of the Forest Plan FEIS (2005b).

Areas that met the FSH inventory criteria were evaluated and considered for wilderness recommendation (FSH 1909.12). The Forest Plan recommended to Congress that 34,500 acres be designated as Wilderness, including the Wild River valley and additions to the existing Sandwich Range Wilderness. The recommended Wilderness lands were assigned to Management Area (MA) 9.1 and will be managed to protect their eligibility for the Wilderness Preservation System. The Than Project does not propose any activities within MA 9.1.

The remaining Inventoried Roadless Areas were assigned to other appropriate Management Areas.

A portion of the Wild River IRA was also identified as part of the 2001 Roadless Area Conservation Rule inventory (Forest Service Roadless Area Conservation, FEIS, Volume 2, November 2000). Approximately 55,000 acres of Forest Plan inventoried roadless areas are affected by the 2001 Roadless Rule.

The Than project proposes no activities within any 2001 Roadless Rule areas; however, the project does propose activities within the Forest Plan Wild River IRA.

Affected Environment for Inventoried Roadless and Wilderness

The Than Project Area includes a portion of the Forest Plan Wild River Inventoried Roadless Area, which comprises 71,387 acres and encompasses most of the area between NH Route 16, east to ME Route 113, and north

Table 23: Inventoried Roadless Area Criteria and Measurement Methods

Criteria	Criteria Description	Used in this Analysis	Rationale and Measurement of Effects on Criteria
1	The land is regaining a natural, untrammelled appearance.	Yes	Indicates prior and proposed activities within the area, particularly timber harvest. Measured by acres of harvest and miles of new road construction.
2	Improvements in the area are being affected by the forces of nature rather than humans and are disappearing or muted.	Yes	Indicates prior and proposed activities within the area including road construction. Measured by miles of new road construction.
3	The area has existing or attainable National Forest System ownership patterns, both surface and subsurface, that could ensure perpetuation of identified wilderness values.	No	The area is in 100% National Forest ownership and the Than Project does not propose any changes to ownership.
4	The location of the area is conducive to the perpetuation of wilderness values. Consider the relationship to the area to sources of noise, air, and water pollution, as well as unsightly conditions that would have an effect on the wilderness experience.	Yes	Indicates existing conditions and proposed activities within the area. Measured by total acres of harvest.
5	The area contains no more than ½ mile of improved road for each 1,000 acres, and the road is under Forest Service jurisdiction.	Yes	Indicates existing conditions and proposed road construction within the area. Measured by miles of new road construction.
6	No more than 15 percent of the area is in non-native, planted vegetation.	No	No actions are proposed that are intended to change this condition and no additional wildlife openings are proposed within the IRA. Risks of introducing and/or spreading non-native plant species is detailed in the non-native plant section of this Environmental Analysis.
7	Twenty percent or less of the area has been harvested within the past ten years.	Yes	Indicates prior activities, planned or ongoing activities, and planned activities within the area. Measured by total acres of harvest and acres of regeneration harvest.
8	The area contains only a few dwellings on private lands and the location of these dwellings and their access needs insulate their effects on natural conditions of Federal lands.	No	No dwellings are present in this area and no actions are proposed that would change this condition.

to US Route 2 (USDA Forest Service, Appendices – Final Environmental Impact Statement 2005). Approximately 23,712 acres of this IRA have been recommended to Congress for Wilderness designation, primarily in the central portion of the IRA, the Wild River valley. The valley is largely separated from roads and other development by the Carter-Moriah Range and the Baldface-Royce Mountain Ridge. The Than Project does not propose any actions within the recommended Wilderness. Approximately 46,879 acres of the 71,387 acre Wild River IRA were designated as roadless in accordance to the 2001 Roadless Area Conservation Rule, and the Than project proposes no activities within any of these areas.

The Than project does propose activities in appropriate MAs within the remaining 24,508 acres of the IRA. Alternatives 1 and 5 do not propose actions within the IRA; Alternatives 2, 3, and 4 propose management actions within a peripheral area on slopes leading to NH Route 16, a generally natural-appearing forested environment with some bare outcrops and vistas. Closer scrutiny reveals evidence of current and past human activity including roads, trails, and extensive timber harvesting.

Approximately 55,178 acres of the Wild River IRA are considered part of its core area of solitude (Forest Plan, FEIS, Appendix C), an area required to be at least 2,500 acres in order to qualify as roadless.

Roadless Characteristics

Roadless characteristics are largely quantitative and objective. They determine whether an area may be *considered* for recommendation as Wilderness. Since a portion of the Than Project falls within the boundaries of the Wild River IRA, the effects of the project proposal on the roadless characteristics of this area will be analyzed. Table 23 lists the criteria, their applicability to this analysis, and how effects on the criteria will be measured if applicable.

Miles of new road construction and acres of harvest (differentiated by regeneration harvest) within the Wild River IRA are the criteria that help disclose effects and define differences between alternatives. The alternatives include differing amounts of road construction, harvest acres, and regeneration harvest. These activities may affect Roadless characteristics in terms of the percentage of the area harvested in the past 10 years, road density, and ability to provide a wilderness experience.

Wilderness Characteristics

Once an area has qualified as Roadless, it is evaluated to determine if it has characteristics consistent with Wilderness: those attributes of an area that may or may not recommend it as wilderness. The effects of the Than project proposal on the wilderness characteristics of the Wild River IRA will be analyzed to determine if the proposed actions would affect any future designation of this roadless area as wilderness. The effects will also take into account effects upon the portion of this IRA that is recommended Wilderness. Not all of the wilderness characteristics will be displayed here, but all can be found in the project Administrative Record (Wilderness Attribute Table).

The following wilderness characteristics will be analyzed in this document:

- **Solitude**, or the degree to which an area provides visitors with a Wilderness experience. Analysis will consider short-term effects and any reduction in the core area of solitude as a result of the project proposal. This effect will be measured by the acres of harvest and new road construction proposed within the core area of solitude.
- **Degree of Disturbance**, or the degree to which an area's natural appearance may be altered. Analysis will consider the effects of timber harvest and road restoration or construction, which will be the measures for comparing the effects of the alternatives.

Analysis of wilderness characteristics will involve some of the same criteria as the roadless characteristics. However, a proposed project may not affect an area's designation as roadless (because it would not change the quantitative criteria to a point the area would no longer qualify as roadless), but it may still affect an area's wilderness characteristics (because it may affect some change in solitude or degree of disturbance).

The nearest Recommended Wilderness to the Than Project Area is the Wild River drainage, which is about 1/2-mile from the nearest proposed harvest unit. The nearest Wilderness is the Presidential Range-Dry River Wilderness, which is over one mile from the nearest proposed harvest unit or management activity. NH Route 16 also lies between the project area and the Presidential Range-Dry River Wilderness. Due to proximity to the project area, effects to wilderness will focus on the proposed Wild River (Management Area 9.1).

Direct and Indirect Effects on Roadless and Wilderness

The Analysis Area for direct and indirect effects on roadless and wilderness characteristics is the Wild River IRA (as detailed in the Roadless Area Inventory, Appendices, FEIS). This analysis area is consistent with the criteria used in the 2005 Forest Plan FEIS analysis for inventoried roadless areas and their potential to be studied for Wilderness designation. The Forest Plan Roadless Area Inventory has determined that Wild River IRA includes approximately 71,386 NF acres, with approximately 10.7 miles of improved roads (a density of 0.15 miles per 1,000 NF acres). The analysis will consider the existing characteristics of the Wild River IRA and how the proposed project may affect the IRA's roadless and wilderness characteristics. The direct and indirect effects for all alternatives are summarized in Table 24.

Alternative 1: No Action

Alternative 1, proposes "No Action" in the Wild River IRA, and thus would have no short-term direct and indirect effects on the that IRA or the wilderness characteristics of the analysis area. Under the No Action alternative, the land would continue to regain a natural, untrammled appearance (Criteria 1), and the forces of nature will continue to dominate, while human improvements would continue to disappear or decline

**Figure 14:
Than Project
FPR Wild River IRA**

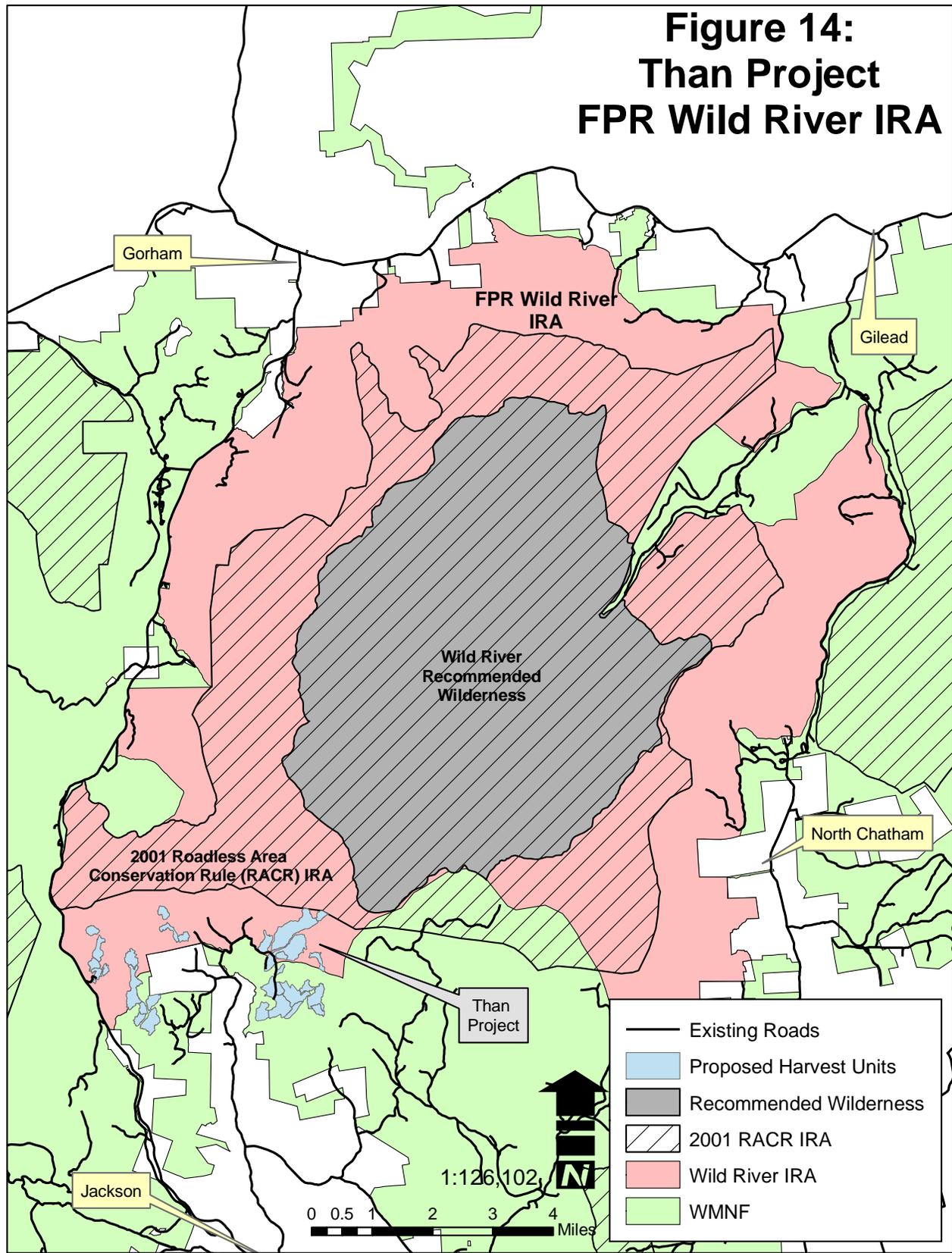


Table 24. Summary of Direct and Indirect Effects on the Wild River Inventoried Roadless Area and Proposed Wilderness.

Roadless/Wilderness Criteria	Wild River Inventoried Roadless Area				
Total Acres	71,387				
Total Harvested Acres					
Acres that could be harvested and still meet roadless criteria (20% of the IRA)	14,277 (20% of 71,387)				
Inventoried Harvest Acres *	473				
Acres Added by Than Proposal	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
	0	464	464	464	0
Total Harvested Acres	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
	473	937	937	937	473
Even-Aged Regeneration Harvested Acres+					
Inventoried Even-Aged Regeneration Harvest Acres *	25				
Regeneration Harvest Acres Added by Than Proposal	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
	0	113	113	130	0
Total Regeneration Harvested Acres	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
	25	138	138	155	25
Improved Roads					
Miles of road that could exist within the IRA and still meet roadless criteria	½ mile per 1,000 (35.7 miles)				
Inventoried Miles	0.15 per 1,000 (10.7 miles)				
Miles Added by Than Proposal	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
	0	0.10	0.10	0.05	0
Solitude					
Minimum core acres to meet Roadless Criteria	2,500				
Inventoried Core Acres of Solitude	55,178				
Core Acres after Than Proposal (All Alternatives)	55,178				

* Data from 1996-2005. Other ongoing projects not implemented will be included in cumulative effects section.

+ Even-aged regeneration harvest includes clearcut, shelterwood, and seed tree timber management prescriptions.

excepting trails and other recreational improvements (Criteria 2). Alternative 1 would not create additional sources of noise, air, and water pollution, or unsightly conditions that would have an effect on the wilderness experience (Criteria 4).

The Wild River IRA currently contains 0.15 miles of improved roads per 1,000 acres; under No Action, the road density would remain the same (Criteria 5). Approximately 473 acres of harvest have occurred in the past 10 years, which is less than 1 percent of the IRA acreage (Criteria 7).

Alternative 2

Alternative 2 would have temporary short-term direct and indirect effects on the Wild River IRA. This alternative proposes 464 acres of harvest within the IRA, including 113 acres of regeneration harvest. This is well below the Forest Service roadless criteria of 20 percent of the IRA (14,277 acres) being harvested in the last ten years. The timber harvest activities would affect the untrammelled, natural appearance of this portion of the IRA; however, these effects would be temporary and should not be noticeable to the eye within a decade or two. These affects include the appearance of skid trails, stumps, and openings. The remainder of the IRA, outside the immediate harvest area, would continue to regain a natural, untrammelled appearance (Criteria 1 and Criteria 7).

The road and trail construction proposed under this alternative within the IRA include the relocation of approximately 500 feet of the Wildcat River Trail and construction of 500 feet or .1 miles of new road. These improvements would be maintained according to Forest Service standards following construction. Other trails that are present within the IRA are maintained according to Forest Service standards appropriate to the Management Area(s) in which they lie (Criteria 2). None of the proposed improvements or those that are currently maintained are inappropriate for the Management Areas in which they are located.

Some short term exposure to noise and truck traffic, for the duration of the harvest activities (2-3 seasons), is expected under this alternative. These effects are very temporary. When harvesting operations are complete, the only noise, air pollution and other impacts to a wilderness experience in the IRA would be those that currently exist such as NH Route 16, Carter Notch Road, and existing roads and trails used by visitors. Visibility of harvest operations may be created by this alternative. However, mitigations detailed in the recreation and visual effects sections, such as slash removal buffers near trails, would greatly reduce the impact of timber management upon the average visitor looking for a wilderness experience (Criteria 4).

The Wild River IRA currently contains 0.15 miles of improved roads per 1,000 acres; under this alternative an additional 500 feet of road would be added. The road density would be increased by less than 0.01 miles per 1,000 acres (Criteria 5). None of the alternatives propose additional miles of improved road within the proposed wilderness area.

Table 24 shows the inventoried characteristics, and the proposed changes potentially affecting those characteristics. A moderate level of past timber

harvest and road construction has occurred in the analysis area. The long-term IRA characteristics are not expected to change as a result of the vegetation management or other proposed actions in Alternative 2. The acres of harvest proposed in each of the Action Alternatives would not affect the size of the IRA or its' eligibility as roadless.

Alternative 2 would have short-term effects upon solitude in the Wild River IRA. The Wild River IRA core area encompasses over 55,000 acres. In order to meet roadless criteria, the core area of solitude must be at least 2,500 acres. Approximately 225 acres of harvest, including 64 acres of regeneration harvest, are proposed within the Wild River core area of solitude. The wilderness experience available in the Wild River IRA would be temporarily impacted by harvesting operations, particularly activities within the core area of solitude, due to the presence of motorized equipment, noise, and transient air pollution. However, long-term effects on the core area of solitude are not expected, and the core area acreage remains well above the 2,500 acre threshold.

This alternative would add to the degree of disturbance in the analysis area. The harvest acres, particularly the 64 acres of regeneration harvest, and the new road construction would alter the natural-appearing forest environment. However, the timber harvest would be a short-term effect that would be minimized as regeneration of vegetation occurs.

Alternative 2 would have limited effect on the roadless characteristics of the analysis area, and no effect on its eligibility as a roadless area. There are no proposed actions in the proposed Wild River wilderness area. None of the proposed actions would result in an irreversible or irretrievable change in the condition of the land or its capability as potential wilderness.

Alternative 3

The effects to roadless and Wilderness for Alternative 3 are identical to those for Alternative 2, including new road construction, total harvest acres, and acres of regeneration harvest.

Alternative 4

Alternative 4 would have slightly less short-term direct and indirect effects on the Wild River IRA than Alternatives 2 and 3. This alternative proposes 464 acres of harvest within the IRA, including 130 acres of regeneration harvest. This is well below the Forest Service roadless criteria of 20 percent of the IRA (14,277 acres) being harvested in the last ten years. The timber harvest activities would affect the untrammeled, natural appearance of this portion of the IRA, however effects would be temporary and should not be noticeable to the untrained eye within a decade or two (Criteria 1 and Criteria 7).

This alternative proposes the same amount of harvest acres as Alternatives 2 and 3; however, it proposes 14 additional acres of regeneration harvest. Units prescribed for regeneration harvest would take a longer period of time to regain a natural appearance. Overall, the degree of effects between Alternatives 2, 3, and 4 on the naturalness of the IRA are very similar,

despite acreage and harvest prescription differences. The remainder of the IRA, outside the harvest units, would continue to regain a natural, untrammled appearance without interruption (Criteria 1 and Criteria 7).

The road and trail construction proposed under this alternative within the IRA includes the relocation of approximately 500 feet of the Wildcat River Trail and construction of 200 feet of new road. These improvements would be maintained according to Forest Service standards following construction. Because of the reduced road construction, Alternative 4 allows this portion of the Wild River IRA to better achieve a more muted presence of human improvements than Alternative 2 or 3 (Criteria 2).

Alternative 4 has less of an effect on road density in the IRA than Alternatives 2 or 3, but a greater effect on road density than Alternative 1 or Alternative 5. The duration of the harvest activities, of 2 to 3 seasons should remain the same as Alternatives 2 and 3. The short-term visibility of harvest operations is similar to Alternatives 2 and 3. With the slash removal zones and mitigations defined in the recreation and visuals sections, the creation of unsightly conditions contrary to wilderness would be minimized (Criteria 4).

This alternative could create some short term exposure to noise and truck traffic. This would be to a lesser extent than Alternative 2 and 3 because of the reduced amount of road construction. In Alternative 4 road construction has been reduced by 300 feet. The Wild River IRA currently contains 0.15 miles of improved roads per 1,000 acres; under this alternatives an additional 200 feet of road would be added to this IRA, negligibly changing the road density (Criteria 5).

Some level of past timber harvest and road construction has occurred in the analysis area, and the long-term IRA characteristics are not expected to change as a result of the vegetation management or other proposed actions of Alternative 4.

Alternative 4 would have short-term effects upon solitude in the Wild River IRA, with 225 acres of harvest, including 81 acres of regeneration harvest, proposed within the core area of solitude encompassing over 55,000 acres. In order to meet roadless criteria, the core area of solitude must be at least 2,500 acres. As stated previously, the wilderness experience possible in the Wild River IRA would be temporarily impacted by harvesting operations, particularly within the core area of solitude, due to the presence of motorized equipment, noise, and transient air pollution. These effects would not remain following harvest operations.

This alternative would add to the disturbance in the analysis area to a degree similar to Alternatives 2 or 3, and would not result in an irreversible or irretrievable change in the condition of the land or its capability as potential Wilderness. There are no proposed actions in the proposed Wild River wilderness.

Alternative 5

Alternative 5 would have the least amount of direct and indirect effects on Wild River Inventoried Roadless Area of all alternatives, except for the No Action alternative. No harvest units are proposed within the Wild River IRA, which substantially reduces the scale of the project and therefore all potential direct effects to the Wild River IRA. Some noise would likely be audible during harvest operations within 1 or 2 miles of harvest units. Under Alternative 5, the duration of activity is expected to be 1 to 2 years.

Alternative 5 would have no effect on the wilderness characteristics of the proposed Wild River Wilderness.

Cumulative Effects on Roadless and Wilderness

The Analysis Area for cumulative effects on roadless and wilderness is the Wild River IRA and is the same as the analysis area for direct and indirect effects. The time frame includes the past decade, present, and foreseeable future (10 years). The cumulative effects analysis considers the prior 10-year period in order to be consistent with the Forest Plan roadless inventory criteria regarding harvest in the last ten years. The cumulative effects analysis also considers reasonably foreseeable harvest through 2015, because that is when the inventoried roadless areas would potentially be re-evaluated for roadless values. The cumulative effects on roadless and wilderness are summarized in Table 25.

The timber harvest includes data from 1996-2005 and recent projects that included timber harvest in the Wild River IRA. The same data sources and time periods were used for road density information. No known projects affecting these characteristics are proposed in the IRA in the foreseeable future.

As detailed in Table 25, the cumulative effects on the Wild River roadless and wilderness characteristics would not compromise the ability of the area to continue to meet Forest Service roadless criteria. The Than Project is not expected to have any lasting or substantial direct, indirect, or cumulative effects on the Wild River IRA or its potential to be recommended for Wilderness during the next Forest Plan Revision process. No other vegetation management projects are planned in the foreseeable future in the Wild River IRA.

None of the alternatives markedly change the cumulative effects on road density. Alternatives 2 and 3 add a slightly greater amount of road construction and therefore a larger degree of disturbance to the IRA. However, this level is not substantial enough to jeopardize or alter the area's roadless designation or its ability to be considered for wilderness designation in the future. The Androscoggin Ranger District does not have any current projects, nor do they anticipate any foreseeable future actions, that would affect the proposed wilderness designation of the Wild River Recommended Wilderness.

White Mountain National Forest – Saco Ranger District

Table 25. Summary of Cumulative Effects on the Wild River Inventoried Roadless Area and Proposed Wilderness.

Roadless Characteristics	Wild River Inventoried Roadless Area				
Total Acres	71,387				
Total Harvested Acres					
Acres that could be harvested and still meet roadless criteria (20% of the IRA)	14,277				
Acres Added by Than Proposal	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
	0	464	464	464	0
Acres Added by Other Proposals**	305				
Acres Added by Foreseeable Future Actions	0				
Inventoried Treatment Acres*	473				
Cumulative Acres Treated	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
	778	1,242	1,242	1,242	778
Even-Aged Regeneration Harvested Acres between 1996-2005					
Acres of Regeneration Harvest	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Added by Than Proposal	0	113	113	130	0
Acres of Regeneration Harvest Added by Other Proposals	85				
Acres of Regeneration Harvest Added by Foreseeable Future Actions	0				
Inventoried Regeneration Harvest Acres	25				
Cumulative Even-Aged Regeneration Harvested Acres	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
	110	223	223	240	110
Improved Roads					
Miles of road that could exist within the IRA and still meet roadless criteria	½ mile per 1,000 acres (35.7 miles)				
Inventoried Miles	0.149 per 1,000 acres (Total miles 10.7)				
Miles Added by Than Proposal	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
	0.00	0.10	0.10	0.05	0.00
Miles Added by Other Proposals	0.00	0.00	0.00	0.00	0.00
Miles Added by Foreseeable Future Actions	0.00	0.00	0.00	0.00	0.00
Inventoried Miles	10.70	10.70	10.70	10.70	10.70
Cumulative Miles of Road	10.70	10.80	10.80	10.75	10.70
Cumulative Miles per 1,000 acres	0.149	0.151	0.151	0.150	0.149
Solitude					
Minimum Core Acres to meet Roadless Criteria	2,500				
Inventoried Core Acres of Solitude Currently	55,178				
Core Acres after Than Proposal (All Alternatives)	55,178				
Core Acres after Foreseeable Future Actions	55,178				

** Connor Brook Project, Rattle River Timber Sale, and Chandler Timber Sale.

+ Even-aged regeneration harvest includes clearcut, shelterwood, and seed tree timber management prescriptions.

Summary and Conclusion

None of the action alternatives considered in detail in this document would dramatically change the Wild River IRA's roadless characteristics. Roadless area values and vegetation management activities have co-existed in this area previously, evidenced by the area's historical treatments and its inclusion in the roadless inventory. Alternative 5's effects would be limited to short-term indirect impacts from noise and traffic associated with harvest activities, and would not persist once the harvest activities were completed. Alternatives 2, 3, and 4 would have measurable direct and cumulative effects on the roadless criteria, but to a very limited degree that would not affect the Wild River IRA's ability to meet the Forest Service roadless criteria.

Alternative 5 would not have any measurable effects on the wilderness characteristics of the Wild River IRA. Alternatives 2, 3, and to a lesser degree Alternative 4, would temporarily affect the wilderness characteristics of the IRA by managing within the core area of solitude and increasing the degree of disturbance. However, these effects would be short-term and would not result in an irreversible or irretrievable change in the condition of the land or its capability as potential wilderness.

The effects to the recommended Wild River Wilderness (Management Area 9.1) would be indirect and limited to the duration of harvest activities. Harvest activities may increase the noise level for those areas within 1 or 2 miles of harvest units.

Air Resources

Issues related to Air Quality:

- *Log truck exhaust could affect local residents along Carter Notch Road.*

Affected Environment for Air Resources

The proposed Than Forest Resources Management Project is located within the White Mountains Airshed, which is the air over the Forest. The Project Area is located in the predominately north-south tending valley of the Wildcat and Ellis Rivers. Regional winds move from west to east. Local winds are dominated by mountain valley dynamics interacting with large-scale atmospheric movements.

In the White Mountain National Forest, the Class I air quality areas are located in the Presidential Range-Dry River Wilderness and the Great Gulf Wilderness Area. Part of the Presidential Range-Dry River Wilderness is within the Ellis River watershed. The wilderness boundary is approximately 0.75 miles from the nearest stand proposed for harvest.

There are six major federally-regulated air pollutants called National Ambient Air Quality Standards (NAAQS). They are ozone (8-hour), carbon monoxide, nitrogen dioxide, particulate matter, sulfur dioxide, and lead. The Project Area is not located in a non-attainment area for any of the NAAQS. The closest nonattainment area is for 8-hour ozone and is located in Merrimack, Hillsborough, Rockingham, and Strafford Counties in southern New Hampshire (USEPA, 2006). Ozone appears to originate around large urban centers and migrates northward to the White Mountain

region during times of high temperature and high levels of solar radiation (NHDES 2006a). The project area is about 40 miles from the closest part of Strafford County.

Existing emissions in the air or air pollution that occurs in the airshed are mostly related to regional and industrial sources. Local sources such as vehicle emissions and dust from roads are a small source of emissions. Fire contributes particulates and carbon monoxide to the air. Dust from roads contributes particulates. Automobile emissions are associated with carbon monoxide, hydrocarbons, nitrogen dioxide, and lead. While in the presence of sunlight, some of these pollutants combine to form ozone.

None of these air pollutants currently exceed New Hampshire or federal ambient air quality standards except for short time periods from wood stoves, wildland fires, and prescribed fires. On occasion, ground-level ozone in the area exceeds air quality standards. This occurs mostly in summer months due to weather and air flow, and is not frequent enough for the area to be categorized as a nonattainment area. Wildland and prescribed fire do not occur in the area at a large scale. Most fires in the White Mountain National Forest are less than 5 acres in size. However, on occasion fires have exceeded 100 acres in size.

The Analysis Area for direct and indirect effects on air resources is the airshed that includes the Ellis River watershed and the Wildcat River watershed. This airshed was selected because the potential effects to air quality generated by any of the proposed activities are likely limited to those areas of operation within the airshed, and they are not expected to extend any further. Outside the valley air pollution enters the larger air mass and is diluted. The ridges within this airshed form a boundary to local air pollution effects by blocking movement of pollutants, keeping the pollutants within the valleys.

Direct and Indirect Effects on Air Resources

Alternative 1: No Action

No activities are proposed and no additional emissions are expected to take place in the Project Area, beyond what occurs now. Forest Service classified roads will continue to receive their scheduled level of maintenance. Vehicle use would continue in the Project Area. These existing emissions are currently contributing to the air quality condition described in the affected environment as well as the larger scale air quality issues discussed in the cumulative effects section of this report.

Action Alternatives 2-5

A concern to air quality is the use of vehicles, heavy equipment, and gas-operated tools during timber harvest, road maintenance, stream restoration and watershed rehabilitation operations in both Action Alternatives. Ground level ozone is worst during summer months, so fall or winter harvest would minimize this effect so that ozone is unlikely to form at elevated levels as a

result of the proposed activities. More than 80 percent of the 1032 acres would be harvested in the fall or winter under Action Alternatives 2 and 3. Under Alternative 4, approximately 75 percent of the acreage proposed for harvest would be harvested in fall or winter, and under Alternative 5, this percentage increases to 85 percent. Because of the limited duration of operation, season of operation, and the relative amount of this emission-generating equipment, it is unlikely that the proposed operations would cause the NAAQS to be exceeded.

Cumulative Effects on Air Resources

The Analysis Area for cumulative effects on air resources is the same as for the direct/indirect effects. This was selected because at this scale the effects of multiple uses within the airshed could become additive and result in cumulative effects. **The temporal scope for cumulative effects on air resources** is ten years past and ten years into the future (1996-2016). This time frame was selected in order to include any activities in the past which could add to cumulative effects, as well as looking far enough into the future so that the effects of the project and any known future activities are fully considered.

Many of the cumulative effects to air quality occurring in the White Mountain National Forest come from upwind, thousands of miles away in the Midwest. Large coal burning plants and other industrial emission sources contribute oxides of sulfur and nitrogen that have resulted in acid rain. This in turn has led to the acidification of ponds and streams across the forest where the buffering capacity is low. This is discussed further in the water resources report. Some large sources within the state and region also contribute to these effects.

As described in the affected environment section of this report, ground-level ozone in the Project Area occasionally exceeds air quality standards, but not frequently enough to be considered in non-attainment. The source of this ozone is large urban centers. All of the nonattainment areas in New England states, except Maine, will have a compliance deadline for 8-hour ozone of June 2010 (USEPA, 2004a). Maine will be in compliance by June 2009 (USEPA, 2004b). Once all counties in New England are in compliance with standards, less 8-hour ozone would be moving into the White Mountains from the urban areas, which should minimize the temporary exceedances which occur in the Project Area.

The New Hampshire Department of Environmental Services has reported that there are no stationary sources of air pollution within the cumulative effects area (NHDES, 2006b).

The Action Alternatives would result in the same emission-producing activities as discussed in the Direct/Indirect Effects Section. None of these emissions are expected to contribute to existing cumulative effects already present in the analysis area; because, as discussed above, the emissions related to the Action Alternatives are expected to be local to the Project Area and of limited extent. These limitations are due to the limited duration of these emissions. Effects of activities both on and off National Forest lands are not expected to cause NAAQS to be exceeded within the time frame analyzed.

Socio-Economics

Affected Environment

The northern New Hampshire and southern Maine economies rely on the forest products industry that provides some of the highest-paying jobs in the area. The Forest Plan (p 1-3, Goals) recognizes the Forest's contribution to regional economies. The Forest Plan's Final Environmental Impact Statement (FEIS pp 3-491 to 3-520) provides detailed information regarding the economic environment the Forest operates in and the recent revenue contributions to regional and state governments. It also indicates that trends in revenue from rooms and meals within four counties in and adjacent to the White Mountain National Forest has steadily increased over the last 15 years. On page 3-492, Figure 3-48 shows that employment (jobs) for the Forest Region has increased most dramatically for government, and slightly in "services" and "retail," and has dropped slightly for "manufacturing." The chapter concludes on page 3-520 by stating that "Overall, economic impacts from recreation exceed all other economic impacts combined," that "the presence of the White Mountain National Forest is a major attraction for visitors in the Forest Region," and that "The loss of land dedicated to producing commercial timber appears to be a continuing trend off-Forest," (Thorne and Sundquist 2001), and finally, that "This has implications for the Forest in that the economic importance of its lands that permit timber management will likely continue to rise."

There are several sawmills and forest product-based manufacturers within close proximity of the Project Area that purchase timber from the White Mountain National Forest. Secondary manufacturing of wood products (furniture, pallets, and dozens of specialty products) are scattered throughout Vermont, New Hampshire, and Maine. Secondary wood products such as milled wood are supplied to manufacturing businesses and retailers throughout the east. Despite the reduction in mills and jobs, there remains a steady demand for timber products sold by the National Forest, as reflected by bids on timber sales.

There are numerous costs associated with implementing a vegetative management project on the National Forest. One significant cost is for analysis: planning the project and analyzing alternatives and potential environmental effects. This includes: 1) surveys (silvicultural, biological, soil, hydrological, and cultural resource); 2) supporting analysis (roads, visuals, and the analysis of the field survey and inventory data); 3) literature reviews; 4) public involvement; 5) interdisciplinary team planning meetings; 6) development of silvicultural (harvest) prescriptions; and 7) preparation of the Environmental Assessment and Decision.

Additional costs are incurred following completion of NEPA to prepare and implement a timber sale contract. These activities include boundary marking, marking trees, contract preparation and appraisal, sale advertisement, and timber sale administration. Timber sale administration includes laying out skid trails, contract administration, site inspections, accounting, implementation monitoring as work progresses, and effectiveness monitoring of the projects design features and mitigation measures.

While one purpose for harvesting timber is to provide high quality sawtimber, the National Forest Management Act directs that decisions to harvest and method of harvest not be based solely on the greatest dollar return or the greatest output of timber. Project design and mitigation measures that reduce sale volume and sale value may result in improved resource protection and increased wildlife habitat features across the project area, and cumulatively over time across the forest.

Communities within which National Forest timber is harvested are reimbursed for the value of that timber through two separate funds.

- New Hampshire taxes the value of timber harvested by the timber purchaser. The revenue goes to the towns in which the timber is harvested. This tax averages about 10 percent of the value harvested. Than Project would provide timber tax directly to the Town of Jackson.
- The Twenty-Five Percent Fund Act of 1908 directed that 25 percent of all monies received from a National Forest during any fiscal year be reimbursed to the towns in which the National Forest is located to be used “for the benefit of public schools and/or public roads.” For Than Project, 25 percent of gross timber receipts would be returned to the Town of Jackson.

The Than project may add to existing wear and tear on Carter Notch Road. Road maintenance costs, and the inconvenience of using public roads while in poor shape until funds are appropriated, is a public concern for Jackson residents. Jackson and Conway businesses benefit from tourism revenue, and in winter, especially, as it relates to availability of all winter sports. For this reason, the project's economic impact on the local economy, while difficult to quantify, is important.

The Analysis Area for direct, indirect and cumulative effects on socio-economics is the Town of Jackson because it would be the beneficiary of any economic activity generated by the Proposed Action and its alternatives. The community of Jackson may absorb some road maintenance costs following project implementation. **The temporal scope for cumulative effects on socio-economics** is ten years past and ten years into the future (1996-2016). This time frame allows consideration of existing and potential future investments in roads by the Town of Jackson, which are pertinent to the Proposed Action and its alternatives.

Direct and Indirect Effects on Socio-Economics

Alternative 1: No Action

Since Alternative 1 harvests no timber, the Town of Jackson would not receive timber tax receipts or benefit indirectly through economic activity associated with logging. This alternative would not meet a Forest Plan goal of “contributing to regional economies.” The cost of Analysis (project planning and environmental analysis) for this project is approximately \$50,000.

Action
Alternatives 2-5

For each alternative, Table 26 shows the estimated gross timber receipts based on proposed harvest volume and estimated bid prices of \$140.00/Mbf. Forest Service costs for preparing and administering each Alternative are estimated based on volume for the Alternative. Net Value of Receipts is the gross receipt minus the cost of analysis, sale preparation, sale administration, and cost of roads and bridges.

Table 26 Economic Characteristics by Alternative

Measure	Alt 1	Alt 2 & 3	Alt 4	Alt 5
Harvest Volume (Mbf)	0	5,600	6,000	3,000
Net Stumpage Receipts*	\$0	\$598,000	\$654,000	\$330,000
• Analysis	\$50,000	\$50,000	\$50,000	\$50,000
• Sale Preparation	\$0	\$65,000	\$65,000	\$35,000
• Sale Administration	\$0	\$30,000	\$30,000	\$20,000
Net Value of Receipts	(\$50,000)	\$267,000	\$323,000	\$135,000
Unit Value \$/Mbf	NA	\$72.08	\$73.58	\$74.25
10% Yield Tax Receipts	\$0	\$59,000	\$65,400	\$33,000
25% Fund Payments	\$0	\$134,550	\$147,150	\$74,250
Receipts to the Federal Government	(\$ 50,000)	\$403,650	\$441,450	\$222,750

NOTES:

- Net Stumpage Receipts = Gross Receipts @ \$140.00 per Mbf, less cost of required road work and bridges. Road cost estimate for Alternative 2 is \$206,000 Alternatives 3&4 is \$186,000, and Alternative 5 is \$90,000.
- Unit Value = Net Value of Receipts / Harvest Volume by alternative
- 10% Yield Tax Receipts and the 25 % payment go to the Town of Jackson

Each of the action alternatives would generate revenue for Jackson from timber tax receipts, the 25 percent fund, and in the region through indirect economic activity associated with logging.

Alternative 1 eliminates tax revenues and other secondary economic effects related to logging. Alternatives 2 and 3 generate similar volume for manufacturing. The highest net receipts, tax revenues, and returns to the federal government and the Town of Jackson is under Alternative 4, followed closely by Alternatives 2 and 3. Of the action alternatives, Alternative 5 harvests the least timber and generates the least in tax payments and government revenue.

The indirect and cumulative economic and social effects of the alternatives are discussed below under cumulative effects. They are derived in part from the effects on recreation as discussed in the Recreation section.

Cumulative Effect on Socio-Economics

Treatments that emphasized improvement to the quality of sawtimber in the harvested stands would be an economic factor in the future, but not within the next 10 years.

Alternative 1 does not harvest timber, but it does not preclude the harvest of timber in the future. The action Alternatives would generate revenue for regional communities and would provide a continued source of quality sawtimber and other forest products on a sustained basis; and would support continued employment in harvesting, manufacturing, transportation, and associated forest products industries. Experience has indicated there is and would continue to be demand for timber products regionally and nationally. Long-term cumulative effects include the increased future value of trees left as improved growing stock in the single tree selection and thinning units.

Revenue generated cumulatively from timber harvesting on National Forest lands and on private lands in the cumulative effects analysis area for this project continue to be a source of revenue for local town budgets. Bear Mountain, Iron Maple II, Back-A-Pickering II, Stony Brook, Tremont, Chandler, Round, and Popple timber sales have generated or continue to generate funds to several local towns. The Than Project would provide a revenue source to Jackson.

All of these existing sales and proposed projects emphasize improvements in vegetative species and structural diversity, in the overall health of these ecosystems, and attempt to assure the quality of residual hardwood and softwood trees for potential future projects that would provide sustainable contribution to the stability of local and regional economies.

Action alternatives may have some short-term adverse effects on tourism and road maintenance costs. Increased road damage and road maintenance costs may be linked to the amount of harvesting (increased road use), and are also affected by road use restrictions when road surfaces are soft from excessive moisture, frost/thaw, or heat.

The social and economic implications, and potential displacement of Nordic skiers to other trails within JSTFs trail system, or to other Nordic ski areas cumulatively, is difficult to measure. Jackson Ski Touring Foundation is likely to experience the greatest direct effects.

However, it is very difficult to measure all of the causes to changes in visitation. The weather (including rain, temperatures, and snow conditions), other valley-wide activities such as highway construction on Routes 302 and 16, the price of gasoline, and other economic factors can influence visitation to the National Forest. Cumulatively, each of the action alternatives would have a very low and perhaps non-measurable effect on the local economies of Jackson and Conway. Alternatives that reduce impacts by reducing harvest volume also reduce tax revenues to the town of Jackson. Again, Alternatives 3 and 4 minimize potential winter effects to JSTF.

The alternatives that reduce summer logging, and thus potential for increased road maintenance costs for Jackson, could have an equal and

opposite effect on the local economy due to adding seasons of winter logging to the sales contract, which would extend the closure on Boggy Brook Trail. Alternatives 5 and 1, which greatly reduce the amount of harvest, also reduce or eliminate potential tax revenues. In summary, the direct effects are a trade-off with no clear advantage of one alternative over the other strictly in terms of reducing adverse social and economic effects. However, the resource analyses in the previous sections show strong differences in the biological benefits of each of the action alternatives.

Heritage Resources

Direct, Indirect and Cumulative Effect on Heritage Resources for all Alternatives

The Analysis Area for direct, indirect and cumulative effects on Heritage Resources is the location of the actual project activities (i.e., the Project Area) since this is where site-specific impacts related to soil disturbance would occur. **The temporal scope for cumulative effects on Heritage Resources** is from the present to the completion of project activities, approximately five to ten years into the future.

The analysis area was surveyed by a cultural resource paraprofessional in 2005, with particular attention to areas near streams, flat areas, rock outcroppings, and in the vicinity of known sites near proposed activity areas. Identified cultural sites *are avoided under all alternatives*. There are currently no National Register of Historic Places within the analysis area. The delapidated structures near the current trailhead for Bog Brook Trail are not a cultural site.

The Forest Archeologist and the State Historic Preservation Officer (SHPO) have reviewed the cultural resource report and the SHPO provided concurrence on January 17, 2006

Invasive Plants

Affected Environment

The Analysis Area for direct and indirect effects to invasive species is the Project Area, including stands proposed for treatment and the connected actions that facilitate treatment (roads, landings, parking areas, trails, wildlife openings, etc.). This area was selected due to logging equipment and trucks traveling within this area and the occurrence of newly created openings. **The Analysis Area for cumulative effects to invasive species** is the lands within the Wildcat River HMU and the Ellis River HMU and adjacent private land, since it is assumed that roads open to vehicular traffic may introduce and/or spread invasive species. The temporal scale is 10 years past and 10 years future.

Invasive plants can spread to other disturbed habitats by wind, water, wildlife, humans, or vehicles transporting seeds or vegetative parts of the plant. Under Executive Order 13112 (February 3, 1999) federal agencies whose actions may affect the status of invasive species shall not authorize, fund, or carry out actions that are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere

unless the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species.

The White Mountain National Forest has been working with The New England Wildflower Society to determine species and locations of non-native invasive plant species. Findings to date have produced a list of invasive species that exist on or near the National Forest. The majority of locations observed have been on the perimeter of the National Forest, primarily along roads, highways and in developed areas such as towns, residential areas, and recreation areas.

Roads

The majority of non-native invasive species (NNIS) locations observed within the vicinity of the WMNF have been along roads and highways, and in developed areas (e.g., towns, housing developments, and recreation areas). Roads, as fragmenting agents, increase the amount of forest-edge habitat on the landscape. The resulting “road-effect zone” is subject to alterations of the microclimate (e.g., increases in light and temperature and a decrease in relative humidity), as well as frequent and intense disturbance activities (maintenance and traffic), the combined effects of which tend to favor the growth of opportunistic NNIS (Parendes and Jones 2000; Forman and Deblinger 2000). Moreover, roads also serve as major corridors for the dispersal of invasive plants through the spread of seed propagules (e.g., seeds or vegetative fragments) that attach to vehicle hardware (e.g., tires and undercarriages) (Westbrooks 1998; Parendes and Jones 2000; Lonsdale and Lane 1994). Resulting weed infestations can extend from the road’s edge to 250 meters into the adjacent forest, or beyond (Saunders et al. 1991; Forman and Deblinger 2000). A Wisconsin study found that non-natives were most prevalent within 15 meters of the road; however, a few species penetrated up to 150 meters into the adjoining hardwood forest (Watkins et al. 2003).

Skid Trails

Skid trails and haul roads within timber sales serve as the primary conduits for non-native species invasion for the same reasons outlined above. A study on managed forest landscapes in Upper Michigan found that understory plant richness was greater in haul roads than in skid trails and forest, due in large part to a greater percentage of introduced species (Buckley et al. 2002). This increase in non-natives was due predominately to elevated levels of photosynthetically active radiation (a measure of light intensity), soil moisture, and compaction along the road edges. The discrepancy between haul roads and skid trails is likely due to improved conditions (e.g. graded and graveled) and increased traffic along the former. A study in Utah supports this reasoning, finding that roadside habitats adjacent to paved and improved surface roads contain a greater cover of both exotic and native species than similar habitats adjacent to less-impacted four-wheel-drive tracks, a trend that extended well beyond the road cut into adjacent, interior plant communities (Gelbard and Belnap 2003).

Riparian Areas

Several studies have found that riparian areas that have high native species richness also have high non-native species richness, due in part to the availability of virtually unlimited resources (i.e., high levels of light and nutrients), as well as a relatively constant state of intermediate disturbance (via flooding and bank scouring) that results in continual structural and compositional changes (Stohlgren et al. 2001; Stohlgren et al. 1998, Planty-Tabacchi et al. 1996). Moreover, streams and rivers form a connected network throughout the landscape, and thus, facilitate the spread of both native and non-native species at a large geographical scale. Disturbance, therefore, in and around riparian areas would greatly increase the risk of introducing and spreading non-natives to these vulnerable ecological communities.

Occupied Habitat

The map of invasive plants near the project area, in conjunction with site-specific field surveys, was used to evaluate the likelihood of NNIS spreading to the project area and the environmental consequences of their potential establishment. Invasive plants were identified outside the project area along Carter Notch Road. Japanese knotweed, Japanese barberry, winged euonymus (burning bush), and Cypress spurge were documented along this access to the project area. None of these are on National Forest land and therefore no eradication efforts have been undertaken by the Forest Service.

Along Route 16 honeysuckle, black locust, sheep sorrel, Japanese knotweed, purple loosestrife, winged euonymus and glossy buckthorn are known to exist. Some of these are on private land, while others, such as purple loosestrife, exist in the Right-of-Way of Highway 16. Eradication efforts have been implemented on this population of purple loosestrife; however, the other species have not been treated in any fashion.

One Japanese Barberry plant was reported near an existing log landing and yellow iris may be present in ditches along FR 233 but it was observed at a time no flowers were present so identification is currently tentative (WMNF unpublished data 2005a).

Direct and Indirect Effects on Invasive Plants

Determination of Risk

Forest Service Manual 2080.44.6 outlines the responsibilities of Line Officers to determine the risk of NNIS introduction or spread as part of the NEPA process for proposed actions. Risk assessments are to be completed for any ground disturbing activities (FSM 2081.03). For projects having moderate to high risk of introducing or spreading noxious weeds (as determined by project Risk Assessments), the project decision document must identify noxious weed control measures that should be undertaken during project implementation to reduce the potential environmental effects of NNIS (FSM 2081.03-1). The overall risk rating assigned for the Than Project is **low** (Project Administrative Record).

**Alternative 1:
No Action**

Alternative 1 would not introduce new migration routes or sites for invasive species. There would be no direct or indirect effects from the proposed projects and associated connected activities.

**Alternatives 2
and 3**

Direct Effects

There is potential for invasive plants to spread into the Project Area along existing roads and other disturbed habitats such as parking areas and recreation sites. Heavy equipment used for timber harvest, road and landing restoration, trail and parking area construction, and culvert removal under either action alternative could spread invasive species into harvest areas and along roadways. A mitigation to reduce this potential is to clean heavy equipment prior to moving it into the Project Area. Another mitigation is to eradicate the existing Japanese barberry and yellow flag iris prior to any heavy equipment moving into the Project Area.

Indirect Effects

The potential for invasive species to migrate into the Project Area from surrounding areas (Map in Project Administrative Record) is greatest in clearcuts, wildlife openings, along roads, and in parking area or trail construction sites where the canopy is removed. Alternatives 2 and 3 would have a similar risk, with Alternative 4 at a slightly higher risk due to increased acres of clearcutting, and Alternative 5 with the lowest risk due to the least amount of total acres harvested and the least amount of clearcutting. The risk of migration is greatest for 1-2 years after implementation, when native plant species are just starting to revegetate the sites. Monitoring for future invasives in the Project Area would be undertaken during post-sale review.

A horse farm exists at the end of Carter Notch Road, and there is evidence of the Bog Brook Trail being used by horses. If feed for these horses includes invasive weed seeds, there is potential of invasives becoming established along this trail from seed disbursed via horse excrement. In addition, people and dogs are also known to be vectors of invasive plants along established trails. The potential for invasive species to become established via many avenues does exist.

Standards and guidelines in the Forest Plan would reduce the level of risk of the spread of invasive plants into the Project Area.

Alternative 4

This alternative would have similar direct and indirect effects as Alternative 2 or 3. Alternative 4 harvests the same total acres, however it increases the number of acres of clearcutting. Clearcutting can create more soil disturbance and increases the amount of sunlight that reaches the ground.

These are two requirements that many invasive species need to become established in new areas. Therefore, Alternative 4 may have a slight increase of risk that invasives become established.

Standards and guidelines in the Forest Plan would reduce the level of risk of the spread of invasive plants into the Project Area.

Alternative 5

Alternative 5 has only 60 acres of clearcutting and a total of 462 acres that would receive any type of harvest. This action alternative has the least degree of risk of overall spread of invasives over the project area. Standards and guidelines in the Forest Plan would reduce the level of risk of the spread of invasive plants into the Project Area.

Cumulative Effects on Invasive Plants

Most known locations of invasive species are in developed landscapes surrounding the Project Area. These known populations do not appear to be expanding into adjacent forested habitats due to the inherent stability of closed-canopy ecosystems. That could change, however, with the introduction of disturbance into these systems. The cumulative effect of the proposed projects in these HMUs, as well as on surrounding private land — particularly even-aged harvest, associated road reconstruction, trail and parking area construction and maintenance, as well as potential development on private land — is the increased risk of introducing invasive species into interior areas of the White Mountain National Forest. Past human activities (timber harvest, recreation, development, maintenance, etc.) have established invasive species at the border of National Forest lands. Continued use of the National Forest creates a high potential that invasives will become established.

Chapter 4 - Preparation and Consultation

ID Team Members and Forest Service Contacts

The following individuals participated in the development and analysis of the proposed action and the alternatives, as well as project design and preparation of the environmental assessment.

Interdisciplinary Team:

NEPA Coordinator /
Silviculture / Layout Rod Wilson, Saco Ranger District
Wildlife Biologist, Fisheries Biologist . Kathy Starke, Saco Ranger District
Silvics Inventory/
GIS Technician / Layout Forester Keith Konen, Saco Ranger District
Assistant Ranger /
Ecosystems Team Leader Rick Alimi, Saco Ranger District
Forest Engineering Technician /
Roads Analysis Jay Sylvester, White Mountain NF
Recreation and Wilderness Holly Jewkes, Saco Ranger District
Wilderness and Roadless Lauren Oswald, Saco Ranger District
Marking Crew
Lead Technician Randy Harrington, Saco Ranger District

Forest Service personnel consulted for professional and technical assistance:

District Ranger Terry Miller, Saco Ranger District
Soils Scientist Andy Colter, White Mountain NF
Hydrologist Tracy Weddle, White Mountain NF
Botanist Kori Marchowsky, Saco Ranger District
Harvest Operations Ken Jeager, Saco Ranger District
Archeological Paraprofessional ... Joe Gill , Androscoggen Ranger District

Other Agencies Consulted:

U.S. Fish and Wildlife Service Susanna L. von Oettingen, Biologist
State Historic Preservation Office James McConaha

Local Organizations and Governments providing public involvement:

Jackson Office of Selectmen Selectmen
Jackson Ski Touring Foundation Thom Perkins

Appendix A – Design Features and Mitigation Measures

In addition to all applicable Forest-wide standards and guidelines listed in the Forest Plan (Chapter 2), the following specific design features and mitigation measures are planned for all action alternatives.

Design Features Common to All Action Alternatives

The Proposed Action has been designed and would be implemented *in accordance with* Forest Plan Forest-wide and MA 2.1 standards and guidelines (USDA-Forest Service, LRMP 2005).

Design Features are highlighted applications of the Forest Plan standards and guidelines. They clarify, where necessary, how these standards and guidelines may apply to specific actions in the project proposal. Design Features for action alternatives include:

- In harvest units 4 and 32, which contained some locations with shallow soils, tree tops and limbs not scattered on skid trails will be left scattered on-site (*LRMP, Forest-wide, Vegetation Management, S-2, S-3, p-2-29*). Whole-tree removal is limited to soils with sufficient nutrient concentration and nutrient replenishment capacity to support the new or residual stand of vegetation, maintain soil productivity, and meet other resource objectives. Tops and limbs from harvested trees must be scattered and left on-site when harvesting on outwash sands or soils shallow to ledge (ie. no whole-tree harvesting on these soil types). Whole-tree harvest is limited on other units but not due to shallow soils or ledge (see Connected Actions).
- Hazard safety signs will be posted on Carter Notch Road during harvest activities (*Specific to Project Area*).
- Where harvest units abut NFSR 233, and hiking trails within or adjacent to units, logging slash would be removed within 50 feet of these features. (*LRMP, Forest-wide, Vegetation Management, clarifies G-2, p 2-29, and G-8, p 2-30*).
- Retain some of the trees with bear claw marks where appropriate (*LRMP, Forest-wide, Wildlife, meets G-1 on p 2-35*).
- During marking of the proposed units, protect raptor nest trees and report their presence to the District Biologist, who determines if further mitigation is needed.
- Where trees will be marked within 100 feet of hiking or Nordic ski trails the trees will be painted on the side away from the trail.
- Skid trails will cross hiking trails at right angles and cross a minimum number of times.
- Permanent culverts will be left in system road NFSR 512 to continue providing drainage since it is used as a nordic ski trail.
- Restrictions will be placed to prohibit hauling on weekends and holidays.
- Continuous communications will be kept with the Jackson Ski Touring Foundation so they can plan their trail use and grooming;

Design Features Related to Soils Resources

The following soil conservation practices are emphasized for this project (*LRMP, Forest-wide, Water Resources, Soil & Water Conservation Practices, S-1, p 2-30 and , Forest-wide, Vegetation Management Practices, G-5, p 2-30*). These Standards and Guidelines (BMPs), are expected to be effective in meeting soil quality standards (USDA-Forest Service, 2005b, FEIS, pg 3-54):

- Where exposure of mineral soil is expected, skid roads should generally be located on grades of less than 20 percent, with only short steeper pitches.
- To limit the area subject to soil compaction, log landings would be the minimum size necessary to meet the requirements of the equipment, the quantity and type of forest products, and safety;
- Upon completion of operations at a landing, the area of disturbance would be graded and stabilized as needed to prevent erosion before the site can revegetate and to accelerate recovery from temporary soil compaction;
- The operating period of timber sale activities are limited to specific season of harvest and/or ground conditions specified in the timber sale contract to minimize adverse soil and water environmental effects. This would be monitored by the Timber Sale Administrator.
- Skidding patterns are designed to fit the terrain to control the volume, velocity, concentration, and direction of runoff water in a manner that would minimize erosion and sedimentation. This preventative practice would be achieved by minimizing the length of skid trails, locating the skid trails in advance, adding drainage features such as waterbars, and designing skid trails to cross streams at right angles. This would be implemented by the Timber Sale Administrator.
- Upon completion of harvesting operations, skid trails would be closed and bare ground seeded as needed in areas where soil erosion potential occurs, such as steep ground and near stream crossings. The Timber Sale Administrator would designate the areas of disturbed soils that must be treated and monitor effectiveness of the treatment.

Design Features Related to Water Resources

The following soil and water conservation practices are emphasized for this project (*LRMP, Forest-wide, water resources, Soil and Water Conservation Practices, S-1, p 2-30*). These Standards and Guidelines (BMPs) are expected to be effective in meeting water quality standards (USDA-Forest Service, 2005b, FEIS, pg 3-54):

- In the Wildcat River watershed, the corridor boundary of the Wild and Scenic River is 500 feet from the center of the river (Wildcat River Comprehensive River Management Plan, 2005). All stands proposed for harvest are located outside this corridor.
- The following soil and water conservation practices are emphasized for this project (*LRMP, Forest-wide, water resources, Soil and Water*

Conservation Practices, S-1, p 2-30.

- Timber harvest units were designed so that units do not span mapped perennial streams. This is a preventative practice to protect water quality. Its effectiveness would be monitored by the Timber Sale Administrator.
- Minimize the erosive effects of water concentrated by roads through practices such as constructing cross drainage structures (culverts) and dispersing runoff away from surface water. This is a preventative practice which would be monitored by the Timber Sale Administrator. The culverts would be left in place on NFSR 512, to continue reducing the likelihood of erosion by providing permanent drainage of the road. Ditches and culverts would be maintained periodically along with other normal road maintenance needed in the area. This would allow for three season use of this road, similar to current use of NFSR 233.
- The number of stream crossings are minimized. Necessary crossings are designed to provide for unobstructed flows during bankfull conditions, as well as for the passage of debris and aquatic organisms. All temporary stream crossings would be removed following use. The Timber Sale Administrator would visually monitor stream crossing sites to catch and rectify any problems in the early stage. This monitoring would continue until the area has successfully stabilized.
- Leave culverts in NFSR 512 road as permanent culverts, allowing administrative use of this road when conditions allow, and extends the grooming season for Nordic skiing.
- Maintain proposed and existing roads to prevent rutting and failures. Adequate maintenance and/or restriction of use can minimize erosion problems. The Timber Sale Administrator would visually monitor roads proposed for use and prescribe corrective measures as needed.

Design Features Related to Riparian and Aquatic Habitats

- No heavy equipment is proposed for use on stream habitat improvement projects in the Wildcat River watershed.
- In the Wildcat River watershed, the corridor boundary of the Wild and Scenic River is 500 feet from the center of the river (Wildcat River Comprehensive River Management Plan, 2005). All stands proposed for harvest are located outside this corridor.

Mitigation Measures Common to All Action Alternatives

Mitigation measures are employed to provide additional resource protection above that required by Forest Plan standards and guidelines. A mitigation helps to meet project objectives and reduces unwanted effects. Mitigations for action alternatives include:

- Tops and limbs from harvested trees will be scattered on skid trails where needed to reduce compaction, soil displacement and erosion during and after operations (*LRMP, Forest-wide, Vegetation Management, exceeds G-5, p 2-30 and Water Resources, exceeds S-1, p 2-30*).

Mitigation	Why Mitigation Works
<p>In the units where harvested trees are skidded whole to landings, tops and limbs will be scattered on landings and skid trails as needed to reduce compaction and erosion during and after operations, during the snow-free season and otherwise as needed. Sale administrator is responsible for determining when and how much is needed, and for evaluation monitoring success of the mitigation during harvest.</p>	<p>Placing slash from delimiting in the skid trails reduces compaction (Martin, 1988). Slash collected on the skid trail will cushion the effects of compaction for tracked vehicles (Oregon State University Extension Service, 1983). Winter harvest minimizes soil erosion, and skidding in the snow-free season may lead to site-specific erosion (USDA-Forest Service, 2005b, FEIS, pp 3-30, 3-31). To minimize compaction, operate on a cushion of slash, or over snow (Poff, 1996). A surface layer of 2" or greater will provide protection from compaction (Poff, 1996).</p>

Appendix B – Where this Project is in the Forest Service NEPA Process

NEPA is the Forest Service decision-making process. An acronym for the National Environmental Policy Act of 1969, NEPA provides opportunities for interested parties to give their ideas and opinions about resource management. This input is important in helping us identify resource needs, which will shape the alternatives evaluated and lead to the formation of a decision.

This form shows the steps of the NEPA process, and where the attached proposal is in that process.

Step One – Need for a Project

The Forest Service or some other entity may identify the need for a project. **YOU** may bring the need for a project to the attention of the Forest Service.

Step Two – Develop Project Proposal

The Forest Service or a project proponent develops detailed, site-specific proposal

YOU may be a proponent who develops a proposal or **YOU** can share input and ideas

Step Three – Scoping and Formal Public Comment Period

The Forest Service solicits public input on the site-specific proposal to define the scope of environmental analysis and range of alternatives to be considered. This combines the scoping period and the formal 30-day public comment period.

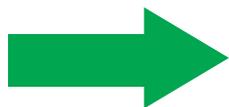
YOU provide timely comments on the analysis during the Comment Period.

Step Four – Develop Reasonable Range of Alternatives

If proposal fits categorical exclusion: Forest Service makes & documents decision

If scoping determines need for EA or EIS: Forest Service develops alternatives

YOU suggest alternatives to the proposed action during the scoping process



Step Five – Environmental Analysis

Forest Service completes analysis of environmental effects and identifies the preferred Alternative

Step Six – Decision

Forest Service makes decision to implement an alternative

YOU review the decision; you can appeal if you disagree and you have “standing”

Standing: You provided comments during the comment period (Step 3)

Step Seven – Appeal

Forest Service allows public 45 days following legal notice of decision to appeal

YOU may file formal Notice of Appeal

Step Eight - Implementation

Forest Service implements the project

YOU may contribute labor, equipment or funding to implement the project

Step Nine - Monitor and Evaluate

Forest Service monitors and evaluates project results and adopts new and proven ideas.

YOU provide feedback on the project to the Forest Service

Appendix C – Glossary

Age Class: A distinct aggregation of trees originating from a single natural disturbance or regeneration cutting

Aquatic Ecosystem: The stream channel, lake, or estuary bed, water biotic communities, and the habitat features that occur therein.

Aspen-Birch Habitat: Forest habitat in which the canopy is comprised almost entirely of aspen species or paper birch. For implementation purposes, this habitat includes forest types 91-95 in our database, but stand conditions, not typing in CDS should be relied on to define habitat.

Basal Area: The area of the cross section of a tree at 4-1/2 feet above the ground. Generally expressed as total basal area per acre.

Biological Diversity: The sum of all natural communities, ecological processes, and species.

Biomass: The weight of a forest, usually expressed in kilograms per hectare.

Board Foot: A measure of lumber volume in a tree. The cubic equivalent of a piece of lumber that is 12 inches wide, 12 inches long and 1 inch thick. Often used variations are MBF (thousand board feet) and MMBF (million board feet).

Clearcutting: The removal in a single cut of the entire standing crop of trees. It prepares the area for rapid seed germination and growth of a new even-aged stand. A variation of clearcutting, known as “clearcutting with reserves,” may be conducted. This practice involves retaining reserve trees or groups of reserve trees to attain resource goals other than regeneration.

Compartment: A small subdivision of forest area for the purpose of orientation, administration, and silvicultural operations. It is defined by permanent boundary features.

Cord: A unit of gross volume measurement for stacked, round wood based on external dimensions, generally implies a stack of wood 4'x4'x8' containing 128 cubic feet.

DBH (Diameter Breast Height): Diameter measurement of a tree at 4-1/2 feet above the ground. Used to determine tree volume.

Design Features: Project design features from Forest Plan standards and guidelines that are specifically pointed out in an environmental document to clarify how these standards and guidelines apply to specific actions in the project proposal. They also may be features that are not directly associated with standards and guidelines but will be implemented on the ground to address site-specific safety or resource needs.

Early-Successional Forest Habitat: Forest habitat that is comprised primarily of tree species that require an open canopy and high levels of light and that typically colonize an area after stand-replacing disturbance (e.g. aspen-birch forest).

Early Successional Species: Those plant or animal species characteristic of early forest successional stages.

Ecological Land Type (ELT): An area of land 100 acres to low 1,000s of acres in size with a well-known succession of forest species on unique soil materials. Ecological Land Type classification is based on geomorphic history, nature of soil substrata, and potential natural vegetation.

Ephemeral Stream: A watercourse or portion of stream which flows briefly in direct response to precipitation or snowmelt in the immediate area.

Even-Aged Management: A timber management system that results in the creation of stands in which trees of essentially the same age grow together. Cutting methods producing even-aged stands are clear cut, shelterwood, or seed tree.

Even-Aged Regeneration Harvest: Cutting method that produces even-aged stands; clearcut, shelterwood, or seed tree.

Forest Product: Sawtimber, pulpwood, and chipwood are the raw products utilized from a tree in a minimum piece length of 8 feet.

Forest Productivity: The amount of living biomass (weight of above ground wood) present on an acre of forest land when measured at different time intervals, e.g., every five years. This is also known as net productivity.

Goals: Broad statements that describe conditions the Forest will strive to achieve through implementation of the Forest Plan. They are generally timeless and not measurable, and their achievement is not required. Goals should be considered when planning projects and activities, and management should move the Forest toward these desired goals.

Group Selection: The uneven-aged-cutting method that describes the silvicultural system in which trees are removed periodically in small groups, resulting in openings that do not exceed an acre or two in size. This leads to the formation of an uneven-aged stand, in the form of a mosaic of age class groups in the same stand. It may be applied in combination with single-tree selection.

Guidelines: A required course of action or level of attainment. It is intended to move the Forest toward desired conditions in a way that permits operational flexibility to respond to variations in conditions. Guidelines can be modified or not implemented if site-specific conditions warrant a deviation. The rationale for deviating from a guideline must be documented in a project-level analysis and signed decision.

Habitat Management Unit (HMU): A block of Forest land in which habitat composition and age class objectives will be established to help ensure that habitats are well-distributed across the Forest and provide a framework for analyzing project impacts to wildlife habitat at a local scale. Blocks vary in size from about 6,000-49,000 acres, and contain a variety of habitat types and land in a mix of Management Areas.

Habitat Type: A small unit of land from a few to over 100 acres lying within a given climatic mineralogical zone and supporting a distinct successional sequence of vegetation growing on a unique type of soil material.

Hardwood: Trees having vessels and rays, and belonging to the botanical group Angiospermae.

Individual Tree Selection: A method where individual trees are selected and harvested in a stand while maintaining a prescribed number of trees in each diameter class (“Q” Factor).

Interdisciplinary (ID) Team: A group of individuals with skills for management of different resources. Team member interaction provides necessary insight to all stages of the process.

Intermittent Stream: A watercourse that only flows at certain times of the year, when it receives water from some surface source (rainfall or snowmelt) or from the intermittent spring, and ceases to flow during other periods of the year.

Land Capability: Inclination of an area to grow a particular broad community (i.e. hardwoods, spruce-fir), due to soil, climate, and geology, if management were not applied. In many places on the Forest, the current community is different from land capability (as indicated by the Ecological Landtype) for the same area because past management altered the vegetation on the site. Given enough time without additional management, the vegetation will revert to the community indicated by land capability.

Log Landing: log decking area, including up to 500 feet of travelway connecting the landing to a classified road.

Management Area (MA): The grouping of land areas allocated to similar management goals such as Management Area 6.2 that puts emphasis on a non motorized dispersed recreation management goal.

Management Indicator Species (MIS): Species whose presence in certain locations indicates a given environmental condition. Their population changes are believed to indicate effects of management activities on a number of other species.

Management Prescription: Management practices and intensity selected and scheduled for application on a specific area to attain multiple-use and other goals and objectives.

Mature Forest Habitat: Stands in which the overstory is in the mature age class. Mature forest habitat is typically made up of trees that are eight inches or more in diameter. Mortality is just beginning in these stands, resulting in a few scattered canopy gaps and a small number of snags and cavities in the overstory. Most snags and down logs are small in diameter and within the intermediate or understory layers. Depending on site conditions, thinning and uneven-aged harvest methods can be used in this habitat without negatively impacting habitat quality. Some uneven-aged harvest may enhance vegetative and structural diversity.

MBF (Thousand Board Feet): A measure of one thousand board feet of wood fiber volume either in log form or after conversion into lumber.

Mineral Weathering: The slow release of elements from mineral soil, pebbles, stones and boulders over time that contribute to forest soil nutrition.

Management Indicator Species (MIS): Species whose presence in certain locations indicates a given environmental condition. Their population changes are believed to indicate effects of management activities on a number of other species.

Mitigation Measure: Includes avoiding an impact altogether by not taking a certain action or part of an action; minimizing an impact by limiting the degree or magnitude of an action and its implementation; rectifying the impact by repairing, rehabilitating, or restoring the affected environment; reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; or compensating for the impact by replacing or providing substitute resources or environments.

Mixedwood Forest Habitat: Also referred to as hardwood-softwood forest habitat. Forest habitat in which the canopy is comprised of a mix of northern hardwoods and hemlock, pine, spruce, or fir. Typically this is a northern hardwood stand with at least 25% made up of softwood species. For implementation purposes, this habitat is usually typed as forest type 87 in the CDS database, but stand conditions, not typing in CDS should be relied on to define habitat.

MMBF (Million Board Feet): A measure of one million board feet of wood fiber volume either in log form or after conversion into lumber.

Motorized Use: Use of vehicles such as snowmobiles, ATVs, helicopters, etc. for transportation on the WMNF by the general public. In Wilderness, this term also refers to any motor-powered implement such as chainsaws, power drills, etc.

Multiple Use: Managing National Forest resources in a manner to best meet the needs of the American people, recognizing that not all uses can occur on all acres and that changing needs and conditions over time will change the combination and intensity of use. Productivity of the land and sustainability of ecosystems is maintained, and the interrelationships among resources and the effects of use are monitored and evaluated. Multiple use management does not necessarily prescribe the combination of uses that will give the greatest dollar return or the greatest unit output.

Natural Community: A system of interacting plants and their common environment, recurring across the landscape, where the effects of human intervention are minimal.

Natural Disturbance: A change in vegetative composition, age class, or structure due to natural occurrences, such as wind, fire, or landslides that are not caused or directly affected by human activity.

Northern Hardwood Forest Habitat: Forest habitat in which the canopy is comprised almost entirely of deciduous hardwood trees, such as sugar maple, American beech, yellow birch, etc. For implementation purposes, this habitat includes forest types 76, 81-86, 88-89 in our CDS database, but stand conditions, not typing in CDS should be relied on to define habitat.

Oak-Pine Forest Habitat: Forest habitat in which the canopy is comprised primarily of oak or pine species. For implementation purposes, this habitat includes forest types 2-3, and 41-55 in our database, but stand conditions, not typing in CDS should be relied on to define habitat.

Objectives: Are measurable accomplishments intended to move the Forest towards the desired conditions described in the goals. Objectives are generally achieved through site-level projects or activities. However they are not the same as “targets,” which are dependent on budgets and their accompanying direction.

Old Forest Habitat: Desired habitat conditions start with those for mature forest and can include greater size, decadence, structural complexity, etc. No harvest will occur in stands identified to provide old forest habitat.

Old Growth Forest: Uneven-aged (three or more age classes) forest with an abundance of trees at least 200 years old, multiple canopy layers, large diameter snags and down logs, and a forest floor exhibiting pit-and-mound topography. There should be little or no evidence of past timber harvest or agriculture. Northern hardwood old growth consists primarily of sugar maple and American beech; softwood old growth is largely made up of spruce and hemlock. Stands need to be at least 10 acres in size to be identified as old growth. Anything smaller is a patch of old trees within a younger stand, not a habitat type in its own right.

Overstory Removal: Mature trees are removed to release regeneration once it has become established, for example in a shelterwood final harvest.

Perennial Streams: Permanently present surface water. Flows occur throughout the year, except possibly during extreme drought or during extreme cold when ice forms.

Permanent Openings: An upland area withdrawn from timber production and managed for wildlife habitat. Trees and shrubs may or may not be present. If trees are present, they could occur in clumps and/or scattered through the area.

Prescribed Fire: Any fire ignited by management actions to meet specific objectives. A written, approved prescribed fire plan must exist, and NEPA requirements (where applicable) must be met prior to ignition.

Regeneration Forest Habitat: Forest in which almost all the trees are 0-9 years old with less than 30 square feet of basal area in a mature overstory. Can be created through natural disturbance (e.g. wind, fire) or the following silvicultural treatments: clearcutting, seed tree harvest, and

shelterwood harvest to 30 basal area or less or with removal harvest within 10 years of original harvest.

Regeneration Harvest: A timber harvest that removes selected trees in the existing stand to a density that allows for the establishment of a new stand.

Riparian Area: Geographically delineable areas with distinctive resource values and characteristics that are comprised of aquatic and riparian ecosystems.

Riparian Ecosystem: A transition between the aquatic ecosystem and the adjacent terrestrial ecosystem; identified by soil characteristics or distinctive vegetation communities that require free or unbound water.

Riparian Management Zone: This zone begins 25' from the bank. The width of the zone depends on the stream order or size of the pond.

Road: A motor vehicle travel corridor over 50 inches wide, unless designated and managed as a trail. A road may be classified, unclassified or temporary.

Road, Forest: As defined in Title 23 Section 101 of the United States Code (23 U.S.C. 101), any road wholly or partially within, or adjacent to, and serving the National Forest System and which is necessary for the protection, administration, and utilization of the National Forest System and the use and development of its resources. Forest roads may be classified, unclassified or temporary.

Road, Classified: Road wholly or partially within or adjacent to National Forest System lands that are determined to be needed for long term motor vehicle access, including state roads, county roads, privately owned roads, National Forest System roads, and other roads authorized by the Forest Service.

Road, National Forest System (NFSR): A classified forest road under the jurisdiction of the Forest Service. The term "National Forest System road" is synonymous with, and replaces, the term "forest development road" as used in 23 U.S.C. 205.

Road, Temporary: Road authorized by contract, permit, lease, other written authorization, or emergency operation, not intended to be part of the Forest transportation system and not necessary for long-term resource management.

Road, Unclassified: Roads on National Forest System lands that are not managed as part of the Forest transportation system, such as unplanned roads, abandoned travel corridors, and off-road vehicle tracks that have not been designated and managed as a trail. This includes those roads that were once under permit or other authorization and were not decommissioned upon the termination of the authorization (36 CFR 212.1).

Road, Unauthorized: A road that is not a Forest road or a temporary road and that is not included in a Forest transportation atlas. An unclassified road may be authorized or unauthorized. A classified road is authorized (unless it is decommissioned).

Road, Decommissioning: Activities that result in the stabilization and restoration of unneeded roads to a more natural state (36 CFR 212.1; FSM 7703). Activities used to decommission a road include, but are not limited to: reestablishing former drainage patterns, stabilizing slopes, restoring vegetation, blocking the entrance to the road, installing waterbars, removing culverts, reestablishing drainage-ways, removing unstable fills, pulling back road shoulders, scattering slash on the roadbed, completely eliminating the roadbed by restoring natural contours and slopes, or other methods designed to meet the specific conditions associated with the unneeded road (FSM 7712). One or many of the methods described may be used as deemed necessary. Decommissioning removes the road from the Forest transportation system.

Road, Maintenance: The ongoing upkeep of a classified road necessary to regain or restore the road to the approved road management objective (FSM 7712.3). Regular maintenance is on going, Restoration maintenance recovers a closed, dormant road to its intended operating condition.

Road, Objective Maintenance Level: The maintenance level assigned to a road, dependent on future road management objectives, traffic needs, budget constraints, & environmental concerns.

Road, New Construction: Ground-disturbing activity that results in the addition of Forest classified or temporary road miles.

Road, Reconstruction: Activity that results in the improvement or realignment of an existing classified road as defined.

Sawtimber: Trees suitable in size and quality for producing logs that can be processed into dimension lumber.

Scenery Management System (SMS): Tool and process developed by USDA Forest Service that provides an overall framework for the orderly inventory, analysis, and management of scenery.

Scenery Management System, Scenic Integrity Objective: Measure of the degree to which a landscape is visually perceived to be intact and whole; an indication of the degree of deviation from the character valued by users for its aesthetic appeal. The Scenery Management System identifies the following levels of scenic integrity.

Very High (Unaltered): Refers to landscapes where the valued landscape character “is intact” with only minute if any deviations. The existing landscape character is expressed at the highest possible level.

High (Appears Unaltered): Refers to landscapes where the valued landscape character “appears intact.” Deviations may be present but must repeat the form, line, color, texture, and pattern common to the landscape character so completely and at such scale that they are not evident.

Moderate (Slightly Altered): Refers to landscapes where the valued landscape character “appears slightly altered.” Noticeable deviations

must remain visually subordinate to the landscape character being viewed.

Low (Moderately Altered): Refers to landscapes where the valued landscape character “appears moderately altered.” Deviations begin to dominate the valued landscape character being viewed but they borrow valued attributes such as size, shape, edge effect and pattern of natural openings, vegetation type changes or architectural styles from outside the landscape being viewed.

Very Low (Heavily Altered): Refers to landscapes where the valued landscape character “appears heavily altered.” Deviations may strongly dominate the valued landscape character. They may not borrow from valued attributes such as size, shape, edge effect and pattern of natural openings, vegetation type changes or architectural styles within or outside the landscape being viewed. However deviations must be shaped and blended with the natural terrain (landforms) so that elements such as unnatural edges, roads, landings, and structures do not dominate the composition.

Scoping: Includes internal and public involvement to determine the range of issues to be addressed in an environmental analysis.

Seed Tree Cutting: An even-aged harvest method which involves the removal in one cut of the mature timber from an area with a small number of seed bearing trees left singly or in groups for regeneration.

Seep: Woodland seeps are small areas, usually less than a ¼ acre, on headwall slopes where groundwater flows to the surface and saturates the soil for some or all of the growing season. Drainage from these areas may create small streams or may return underground.

Shelterwood Cutting: The even-aged cutting method that describes the silvicultural system which provides a source of seed and/or protection for regeneration. The old crop (the shelterwood) is removed in two or more successive cuttings. The first cutting is ordinarily the seed cutting (a regeneration cut) though it may be preceded by a preparatory cutting, and the last cut is usually the removal cut.

Silviculture: The art and science of controlling forest establishment, composition, structure, and growth.

Single Tree Selection Cutting: An uneven-aged cutting method where individual trees are selected and cut in a stand while maintaining a prescribed number of trees in each diameter class.

Slash: Debris left after logging, pruning, thinning, or brush cutting, and large accumulation of debris after wind or fire. It includes logs, branches, bark, and stumps.

Softwood: Trees belonging to the botanical group gymnospermae.

Soil Productivity: Inherent capacity of a soil to support the growth of specified plants, plant communities, or a sequence of plant communities. Soil productivity may be expressed in terms of volume or weight/unit area/year, percent plant cover, or other measures of biomass accumulation.

Special Use Permit: A type of special use authorization that provides permission, without conveying an interest in land, to occupy and use national forest land or facilities for specific purposes, and that is both revocable and terminable. A permit is not transferable. There are different classes, categories, and designations of special use permits.

Spruce-Fir Forest Habitat: Forest habitat in which the canopy is comprised almost entirely of balsam fir or red spruce. For implementation purposes, this habitat includes forest types 11-19 in our database, but stand conditions, not typing in CDS should be relied on to define habitat.

Stand: A community of naturally or artificially established trees of any age sufficiently uniform in composition constitution, age, spatial arrangement, or condition to be distinguishable from adjacent communities, thereby forming a silvicultural or management entity.

Standards: A course of action that must be followed, or a level of attainment that must be reached, to achieve management goals and objectives. In general standards limit project-related activities. Deviations from standards must be analyzed and documented in a Forest Plan amendment.

Suitability: The appropriateness of applying certain resource management practices to a particular area of land, as determined by an analysis of the economic and environmental consequences and the alternative uses foregone. A unit of land may be suitable for a variety of individual or combined management practices.

Suitable Forest Land: Land that is to be managed for timber production on a regulated basis.

Sustained-Yield: The achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources of the National Forest System without impairment of the productivity of the land.

Temporary Openings: Openings that result from timber harvest activities in an area where nearly all trees are removed. Many wildlife species that utilize openland habitat, utilize these areas until tree regeneration dominates the stand. Temporary openings can provide habitat for openland wildlife species for 5-10 years. These areas are considered temporary openings until the regeneration exceeds 10 feet in height.

TES Species: Plant or animal species that are designated as threatened or endangered by the U.S. Fish and Wildlife Service or that are designated as sensitive by the Regional Forester.

Thin: a cultural treatment made to reduce stand density primarily to improve growth, enhance forest health, or recover potential mortality.

Timber Production: The purposeful growing, tending, harvesting, and regeneration of regulated crops of trees to be cut into logs, bolts, or other round sections for industrial or consumer use.

Timber: Wood retaining many of the recognizable characteristics of a tree: round, bark covered and tapering, but without limbs and leaves. In the wood industry usage it may be “standing timber,” that is the portion of the living tree with characteristics of value to the wood using industry or cut trees not yet processed beyond removing limbs and tops.

Travel Corridor (sometimes referred to as Travelway): A discernible route not likely to recover naturally within one year. These routes were at one time meant for one or more types of four wheel or tracked vehicles. Examples include timber skid routes, temporary roads, and abandoned roads. These do not include Forest System Trails, incidental trails, or classified Forest System roads.

Uneven-Aged Management: The application of a combination of actions needed to maintain continuous high forest cover, recurring regeneration of desirable species, and the orderly growth and development of trees through a range of diameters or age classes to provide a sustained yield of forest products. Cutting is usually regulated by specifying the number or proportion of trees of particular sizes to retain within a stand, thereby maintaining a planned distribution of size classes. Cutting methods that develop and maintain uneven-aged stands are single-tree selection and group selection.

Unsuitable Forest Land: Forest land that is not managed for timber production because (a) the land has been withdrawn by Congress, the Secretary, or the Chief; (b) the land is not producing or capable of producing crops of industrial wood; (c) technology is not available to prevent irreversible damage to soils, productivity, or watershed conditions; (d) there is no reasonable assurance that lands can be adequately restocked within 5 years after final harvest, based on existing technology and knowledge, as reflected in current research and experience; (e) there is at present, a lack of adequate information to respond to timber management activities; or (f) timber management is inconsistent with or not cost efficient in meeting the management requirements and multiple use objectives specified in the Forest Plan.

Vegetation Management: Manipulating vegetation to reach desired habitat or ecosystem goals. See also Timber Management.

Vernal Pool: Naturally occurring, depressional wetlands that temporarily hold water in the spring and early summer, drying up typically in mid to early summer. They are isolated without an inlet or outlet. They are fishless and allow for successful breeding of certain amphibians and invertebrates.

Volume: The measure of quantity forest products (sawtimber, pulpwood, and chipwood). The cubic equivalent of a piece of lumber 12 inches wide, 12 inches long, and 1 inch thick is known as a board foot. A MBF is the measure for 1000 board feet, and a MMBF is a million board feet.

Wildlife Opening: Terrestrial opening dominated by native grasses, forbs (e.g., goldenrod, ferns, meadowsweet), and/or shrubs (e.g., blackberries, raspberries, blueberries, alder) that is maintained in an

non-forested condition naturally or through stumping, mowing, prescribed burning, brushing, or other means to benefit wildlife. It must remain in shrubby or herbaceous vegetation and have minimal (<15%) overstory canopy conditions. Only areas that are maintained primarily for wildlife benefits are considered wildlife openings; other herbaceous openings exist on the Forest and may provide wildlife habitat, but they are not considered wildlife openings for the purposes of this Plan.

Wildlife Tree: A live tree greater than 18" dbh with 2 or more defects that can be used as cavities. In aspen and paper birch communities, the dbh should be greater than or equal to 14 inches.

Whole Tree Harvest: Cutting and removing the entire upper portion of a tree consisting of the trunk, branches, and leaves or needles.

Young Forest Habitat: Results from growth of regenerating forest habitat. It also is created when the overstory is removed from a shelterwood harvest more than 10 years after the original harvest. Canopy trees are typically shorter than at maturity and small in diameter, usually less than eight inches.

Appendix D – References and Literature Cited

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Appendix E – Comments on the Than Project and Forest Service Responses

For The Comment Period January 24 to February 23, 2006

Each comment received during the 30-day comment period was reviewed to identify site specific issues and concerns. Each comment listed includes a response and where appropriate, lists where supporting information can be located in the EA. We appreciate the comments provided for the Than Resource Management Project - Public Comment Package.

Comments responding to the Public Comment Package released on January 24, 2006 were reviewed to identify specific issues and concerns. Comments were reviewed by the Interdisciplinary Team, in some cases leading design changes in the EA and to the development of Alternatives 4 and 5. Also, comments were used to help focus the analysis of environmental effects contained in Chapter 3 of the Environmental Assessment. The following table lists the specific comments and issues identified by the ID Team from letters received during the public comment period, and our responses to them. The original letters are located in the Than Project File at the Saco Ranger Station.

Issue #: Each unique issue is assigned a number. In some cases, a specific issue was identified by more than one commenter.

Subject: The issues were lumped into subject categories, in order to more efficiently provide Forest Service responsive statements.

Responder #: Each person or group who provided comments on the Than project is assigned a responder number. Numbers were assigned generally in the order in which letters were received, in ascending order.

Responder Name: The name of the person(s) providing this particular comment.

Comment: The substance of the comment is paraphrased in this block. An attempt was made to fairly represent the gist of the commenter's concern.

Forest Service Responses: In this block, an attempt is made to provide a substantive response to each comment. In some cases, two or more comments are similar enough that a single response is given. Because the responses are brief, the reader is encouraged to refer to the "disposition" column that shows where in the EA the subject is addressed.

Disposition: Information about where in the EA or project file this issue is addressed is shown here. This block provides a convenient way of tracking how the Forest Service followed through within the NEPA process to make sure this issue was addressed.

The names of persons who responded to the Public Comment Package for the Than Project are listed on the next page, followed by a table that displays the summarized comment and Forest Service Response.

Than Forest Resource Management Project – Environmental Assessment

Commenters (generally in chronological order by date of postmark/receipt):

Postmark/Receipt

<u>Responder #</u>	<u>Name</u>	<u>Date (2006)</u>
1	Iris Baird	1/26
2	Maryann Pike	1/27, 2/1
3	Thomas Linell	2/5
4	George Howard	2/7
5	Phillip Sferes	2/6
6	Ruthann Brown	2/29
7	Thom Perkins (JSTF)	2/17
8	Pierce Beij	2/9 & 2/15
9	Roger Chambers	2/17
10	Daniel Dinsmore	2/16
11	Jerry Marceau,	2/17
12	Beth, Kevin & Mary Gibson	2/18
13	Rose Buckingham	2/19
14	Renee Voss (Sierra Club)	2/20
15	Ken Kimball (MW Nordic Club)	2/20
16	Peter & Emily Benson	2/21
17	Fred Lavigne	2/21
18	Jason Stock (NHTOA)	2/22
19	Daniel Yetter (Friends of Wild River)	2/22
20	Frank Robey	2/20
21	Tom VanVechten	2/22
22	Walter Yaceshyn	2/23
23	Betsey Harding	2/24
24	Samuel Harding	2/24
25	Martha Benesh	2/24
26	Justin Kermond	2/27
27	Bob Richardson	2/9
28	Joan and Loren Billings	2/17

	A	B	C	D	E	F	G
	Issue#	Subject	Responder #	Responder Name	Comment	Forest Service Response	Disposition
1	1	ATVs	20	Frank Robey	Concerned that ATVs may go into the proposed 4-acre wildlife opening (as currently occurs on Hut Road).	ATVs are prohibited on the White Mountain NF and have been able to be reasonably controlled through normal enforcement. Forest closure orders are in place to deal with illegal use when and where it occurs. There is little reason to believe the proposed opening will attract ATV use, but if it does, we expect that law enforcement will be able to control it.	Not an issue to be evaluated in the EA. Address through continued law enforcement.
2							
3							
4	2	Conservation Educ.	8	Pierce Beij	The project should include in its Purpose and Need the Forest Plan goal (p.1-17, LRMP) as a purpose of this project: "the Forest timber harvest program will function as an outdoor classroom."	Although conservation education is not an immediate purpose for the proposed action, we fully expect that properly executed harvest will provide opportunities for interpretation to visitors of the area, particularly for skiers from Jackson Ski Touring Foundation. These will be pursued when possible.	Not an issue to be evaluated in the EA. Post-harvest opportunities for interpretive signing may be pursued as they occur.
5							
6	3	Fish Habitat	3	Thomas Linell	Forest Service needs to provide a more detailed description of the proposed fish habitat improvements. What exactly is proposed?	The EA provides a description of the proposed action and alternatives, as well as analysis of their likely effects. The exact locations and number of structural improvements in the streams will be determined based on stream surveys to be conducted if this project is approved. The intensity of work is expected to be similar to other streams where such improvements have been successfully made, i.e. Evans Brook, Great Brook, Upper Ammonousuc.	Description of proposed actions can be found in EA Ch. 2.B "Description of Alternatives". Likely effects are described in EA Ch. 3.5.1, 3.6.1, and 3.7.1
7	4	Fish Habitat	17	Fred Lavigne	Not in favor of proposed fish structures, & questions their benefits versus the added soil and water effects.	Recent efforts on the WMNF to accelerate the recruitment of large woody structure in streams have proven successful in increasing stream productivity, based on the preliminary results of pre- and post-project monitoring at Great Brook and other streams.	Issue is evaluated in the EA. Effects analysis cited above describe benefits and effects of fish structures.
8							
9	5	IRA (Inventoried Roadless Areas)	3	Thomas Linell	Objects to any FS road construction in "roadless" area.	Four respondents object to road construction and/or harvest activities within "inventoried roadless areas". These "IRAs" were identified during Forest Plan Revision as having certain characteristics of roadlessness, making them eligible for Wilderness consideration. Once considered through the Revision process, those areas not included as proposed "Wilderness Study Areas" were returned to the land base for assignment to other Management Areas (MA). Units proposed in the "Than Project" are all within MA 2.1, allowing sustainable forest management. The criteria used to identify Roadless Areas in Eastern National Forests are different from those used in western States. These criteria are found FS Handbook 1909.12, ch. 7.11b. Contrary to their name, "roadless" areas in the East can contain roads (up to 1/2 mile per 1000 acres) and recent forest harvest on up to 20% of the area. Other attributes of roadless areas are described in FSH 1909.12. None of these roadless attributes is likely to be compromised by the modest level of forest management proposed in the Than project.	1. An alternative (Alternative 5) was developed and evaluated in the EA that proposes no harvest or road activities within the area inventoried as roadless during the Forest Plan Revision. See EA Chap. 2B.
10	5	IRA	14	Renee Voss (Sierra Club)	FS needs to develop an alternative that does not propose roads or harvest in roadless areas.		2.
11	5	IRA	20	Frank Robey	All units proposed for harvest in IRA should be deleted.		
12	5	IRA	21	Tom VanVechten	Object to proposed road construction into unit 19, or any other roads in IRA.		

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13	6	IRA	14	Renee Voss (Sierra Club)	Project will have significant effect on roadless character of IRA; therefore an EIS is required by FSH 1909.15, ch. 20.6	FSH 1909.15, Chapter 20.6 states that an EIS is required if a proposed action "would substantially alter the undeveloped character of a roadless area of 5000 acres or more". The environmental assessment examines the proposed action and alternatives in light of possible effects on the 8 criteria from FSH 1909.12, Ch. 7.11 used for determining eligibility for roadless consideration. Based on analysis found in the EA, Ch.3.9, there is no reason to conclude that the Than project will reduce the area's eligibility for roadless consideration in the future, any more than previous management reduced its eligibility in the recent Forest Plan Revision, completed in 2005.	EA, Chapter 3.9 addresses issues related to the potential effect of the Than project on inventoried roadless and Wilderness.
14	7	IRA	14	Renee Voss (Sierra Club)	Final Roadless Rule (2001) identified nine roadless characteristics of IRA's, and Than will affect soils, habitats, semi-primitive character, and other characteristics of IRAs (40 CFR 1527.3)	The Roadless Rule of 2001, after its implementation was clouded by litigation for a period of years, was essentially superseded by Interim Directive #1920-2006-1 issued on 1/16/2006. The nine roadless characteristics cited in the commenter's letter are specific to the 2001 Rule, and are not applicable to the agency. Current requirements pertaining to projects in inventoried roadless areas are wholly contained in the same directive, and they contain no reference to the nine roadless characteristics.	Not an issue to be evaluated in the EA. EA, Chapter 3.9 addresses the potential effect of the project on inventoried roadless, using the "Criteria for Roadless Areas in the East", found in FSH 1909.12, Ch. 7.44b.
15	8	IRA	14	Renee Voss (Sierra Club)	Project is highly controversial and precedent setting (40 CFR 1527.4,6). Commenter states that Than is the first project in eastern US to propose road building in an IRA since the initiation of the Roadless Conservation Rule. Therefore, he states, the Than project sets a precedent, and an EIS is required.	The National Environmental Policy Act of 1969, or NEPA, is promulgated through regulations found in 40 CFR 1500-1508. Projects likely to have "significant" effects on the quality of the human environment require an EIS (40 CFR 1502.3). Among the factors to be evaluated in determining significance are "the degree to which effects are likely to be highly controversial" (1508.27[b]4) and "the degree to which the action may establish a precedent for future actions with significant effects" (1508.27[b]6) "Controversy" in NEPA refers to scientific controversy over effects, and the effects of the proposed action on forest resources are well-established and not controversial (see EA Chapter 3). Likewise, "precedent-setting" in NEPA refers to decision that may apply to future decisions or lead to additional actions.	Not an issue to be evaluated in the EA. Further discussion may be provided in the Decision Notice/FONSI before a determination of "no significance" is made.
16	9	IRA	14	Renee Voss (Sierra Club)	Numbers on table 5, p.38 are misleading. Miles of "skid road" & trails are not included, and their effect on roadless, water quality not addressed.	"Skid trails" or "skid roads" are fairly synonymously often used to describe the paths followed by skidders in moving timber to the landing. They are not considered in the category of improved or classified roads in their effects on roadless character, because they are temporary routes that will be restored. Other effects of skid trails on roadless and water quality can be found in the EA.	Effects addressed in the EA: Soils - Chapter 3.3; Water Resources - Chapter 3.4; Wild & Scenic Rivers - Ch. 3.6; Roadless - Chapter 3.9
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18	10	IRA	19	Daniel Yetter (Friends of Wild River)	Concerned with effects of clearcuts 12, 14, 17, 25, 29, 31, & 33 on inventoried roadless acres. Prefer only partial cuts be proposed in IRAs.	The Than Project proposes a total of 129 acres of clearcuts in the IRA (Alt4). All are in Management Area 2.1 which allows for use of even-aged regeneration harvest, or clearcutting. The proposed action includes approximately 117 acres within the inventoried roadless area. While this will temporarily alter the appearance of the area (EA, Chapter 3.2, "Effects on Scenery"), it will do so in order to meet important forest and habitat management objectives of the Forest Plan (EA, Chapter 3.8, "Wildlife"). Clearcuts are distributed evenly across the entire HMU, and the "roadless" portion of the HMU are not disproportionately affected. Harvest levels are well within the margin needed for the area to continue to be considered as meeting the "Criteria for Roadless Areas in the East" (EA, Chapter 3.9, "Roadless").	Effects addressed in the EA: Chapter 3.2, "Effects on Scenery"; Chapter 3.8, "Wildlife"; EA, Chapter 3.9, "Roadless"
19	10	IRA	21	Tom VanVechten	In order to better resemble natural disturbance & lessen effects to IRA, clearcut units 12, 14, & 17 should be converted to uneven-aged management or partial cut.		
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21	11	Lands	3	Thomas Linell	Maps 3 & 6 differ in how they depict NF property East of Spruce Mtn. Does it touch Carter Notch Road or not?	This was in fact an error in the Public Comment Package that we have corrected in the EA. Figure 6 incorrectly showed National Forest land east of Spruce Mountain extending all the way to Carter Notch Road. Thank you for bringing this to our attention.	Not an EA issue. Correction made to EA, MA Map, Figure 6.
22	11	Lands	6	Ruthann Brown	Claims her property is shown on map as NF land (east of Spruce Mtn., MA 6.1). Is this an error?		
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24	12	NEPA	14	Renee Voss (Sierra Club)	Cites the Jan.16, 2006 Directive as requiring the Chief's approval for any activity in inventoried roadless (ID 1920-2006-1)	Interim Directive 1920-2006-1 was issued by the Chief of the Forest Service to provide direction on managing inventoried roadless areas on those Forests who had not yet completed a Forest Plan Revision, to ensure these areas were properly handled. Paragraph 1925.04a(2) states that "(t)his reservation applies until revision of a land and resource management plan... that has considered the protection and management of inventoried roadless areas." The Record of Decision for the WMNF Forest Plan addressing roadless area management was signed by Regional Forester Randy Moore on 9/13/2005.	Not an issue to be addressed in the EA.
25	12	NEPA/NFMA	20	Frank Robey	Interim directive 1920-2006-1 requires a forest scale roads analysis is complete & incorporated in the Forest Plan. Has this been done?		
26	13	NEPA	4	George Howard	I am concerned about the excessive NEPA process & cost required to manage National Forest, compared with private land.	We agree. Despite efforts to streamline the NEPA process, frequent challenges, case law, and agency direction more often require us to add material to our EAs rather than reducing paperwork (as the NEPA Regs direct in 40 CFR 1500.4).	Not an issue to be addressed in the EA.
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28	14	NEPA	14	Renee Voss (Sierra Club)	Forest Service did not provide a draft EA for comment period, therefore the public cannot provide meaningful comments. [claims this violates 40 CFR1501.4(e)(2) and 36 CFR215.6]	The Public Comment Package released in January 2006 is in complete accordance with public involvement requirements defined in 36 CFR 215 regulations published on June 4, 2003. The regulations provide for one official comment period in which the public is given "the opportunity to comment on a proposed action implementing the land and resource management plan" 36 CFR 215.5(a)(1) It directs that "the Responsible Official shall determine the most effective timing for publishing the legal notice of the proposed action and opportunity to comment." 36 CFR 215.5(a)(2) The regulations do not require the completed EA be provided, only the proposed action. Our public comment package was designed to provide sufficient site-specific detail, a proposed action, and an alternative that we determined through scoping would address likely issues. We believe this streamlined package is easier to understand, is accurate and sufficiently detailed for the public to provide substantive comments. This then allows for a more focused EA and effects analysis that can best zero in on the issues most important to the public.	Not an issue to be addressed in the EA. Over 25 parties provided good and substantive comments to the Than project.
29	14	NEPA	20	Frank Robey	Forest Service should have provided an EA during comment period.		
30	14	NEPA	20	Frank Robey	Public Comment Package does not provide sufficient detail for public to identify issues.		
31	15	NEPA	14	Renee Voss (Sierra Club)	Need to address cumulative effects and clearly catalog past, present, & future projects & their cumulative effects on all resources, including soils erosion/ compaction, streams & water quality.	We agree. Cumulative effects are addressed in the EA.	Cumulative effects of proposed action and alternatives are addressed in the EA: Chapter 3 (by resource area)
32	15	NEPA	20	Frank Robey	EA should describe how the project will affect (directly & cumulatively): vegetation, recreation, wilderness, IRAs, soils, stream condition, water quality, fish, wildlife, etc.		
33	16	NEPA	17	Fred Lavigne	Concerned about units being marked before NEPA is completed.	We would prefer to have projects "on the shelf" before marking occurs, but the time-consuming nature of the NEPA process occasionally puts us in the position of doing design work on-the-ground before a NEPA Decision is signed. This is a management risk that must be carefully calculated, and is ideally the exception rather than the rule.	Not an issue to be addressed in the EA.
34	17	NEPA (mitig.meas.)	14	Renee Voss (Sierra Club)	Should include site-specific mit.measures, & a plan to monitor for their implementation and effectiveness.	Site-specific design features and mitigation measures are planned for all Alternatives in the Environmental Assessment. Monitoring to be accomplished through sale administration and possible NEPA compliance review.	EA, Appendix A - Design Features & Mitigation Measures
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36	18	NFMA	14	Renee Voss (Sierra Club)	Optimality of clearcutting is required by NFMA.	Intensive field visits to each stand were completed during May October 2006 by the Districts 'Certified Silviculturist', who determined that clearcutting was the required prescription for these clearcut units in order to meet Forest Plan objectives. These prescriptions were confirmed as being appropriate to meet wildlife habitat objectives by the project Biologist. The Decision Notice/FONSI is based on the analysis found in the EA.	Addressed in the DN/FONSI, and in the Project Record (silviculture prescription)
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38	19	Old Growth	14	Renee Voss (Sierra Club)	Expresses concern that the FS is harvesting "old growth". FS should retain old growth, analyze impacts.	Old growth is defined in the 2005 Forest Plan as a forest 200+ years old or an uneven-aged (three or more age classes) forest with an abundance of trees at least 200 years old. The project is entirely within Management Area 2.1, all of which has been harvested within the last 100 years. The abundance of semi-primitive MA 6 lands scattered throughout the area, as well as the presence of MA 8.6 (Wild & Scenic Rivers), would assure that communities of mature and overmature trees will be protected in this HMU in the foreseeable future.	Not an issue to be addressed in the EA. Effects of project on mature forest is addressed in the EA, Ch. 3.8.
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40	20	Rec	16	Peter & Emily Benson	Concerned about effects to Halls Ledge Trail of harvesting unit 27.	Mitigation measures are incorporated into the project for (1) marking paint to be applied on the backside of trees facing away from all hiking trails, and (2) slash disposal zone of 50 feet on either side of all hiking trails.	EA - Appendix A - Design Features & Mitigation Measures
41	20	Rec	17	Fred Lavigne	Unit 27 is intersected by Halls Ledge Trail, will result in more light to the ground & growth of underbrush.		
42	21	Rec	17	Fred Lavigne	Harvest in Units 21 & 22 will take away from the wild "feel" of Wild River Trail.	The Wild River Trail traverses only a small portion of Unit 21 in Alternatives 2 and 3, and as a thinning, the effects would be limited and temporary. Also, Alternatives 4 and 5 were added to the project EA, and Units 21 and 22 are not included for harvest in either alternative. Marking and slash mitigation along trails apply as stated above.	Addressed in part by adding Alternatives 4 and 5. See also EA Chapter 3.1, Recreation Effects
43	21	Rec	21	Tom VanVechten	Protect trail character for Wild River Trail & Bog Brook Trail when harvesting units 15, 16, & 21.		
44	22	Rec	17	Fred Lavigne	Units 15 & 16 are right at edge of Bog Brook Trail. FS should mitigate visual effects by using buffers.	The Bog Brook Trail does not traverse or enter either unit. Unit 15 is approx. 100 setback from the Trail, and Unit 16 has a 50-foot setback. As selection cuts, the effects would be limited and temporary. Also, Alternative 5 was added to the project EA, and Units 15 and 16 are not included for harvest in that alternative.	Addressed in part by adding Alternatives 5. See also EA Chapter 3.1, Recreation Effects
45	23	Rec	17	Fred Lavigne	FS should avoid skidding/hauling on trails. Prefer you only cross trails at right angles.	Mitigation measure is incorporated into the project to minimize skidder crossings of Trail, and at 90 degree angle where possible.	EA section 3.1.1, Appendix A - Design Features & Mitigation Measures
46	24	Rec	19	Daniel Yetter (Friends of Wild River)	Table #5: A measurement indicator for "Effects to hiking trails" should be added, and include effects of harvest to Wild River Trail & Bog Brook Trail.	Table 5 in the Public Comment Package was an abbreviated overview of potential effects. The effects to hiking trails of the 4 action alternatives is more fully addressed in the EA, both on the summary table (Table 7) and in the Environmental Consequences Chapter 3.	Addressed in EA: Chapter 2 E - Table 7 Comparison of Alternatives; and Chapter 3.1 "Effects to Recreation".
47	25	Rec	2	Maryann Pike	Bog Brook Trail - please preserve it for hikers only.	Bog Brook Trail will continue to be maintained as a primary hiking trail.	Not an issue to be addressed in the EA.
48	26	Rec	2	Maryann Pike	Where will the new trailhead be?	The Bog Brook summer parking is planned in a location near the gated end of Carter Notch Road where it might better serve hikers onto both the National Forest and town land in the Prospect Farm area.	Not an issue to be evaluated in the EA.
49	27	Rec (Bike)	25	Martha Benesh	Page 10-11 refers to mountain biking being allowed on JSTF Trails - this should be deleted since it is not necessarily true.	Your comment correctly points out a statement in the PublicComment Package that could be misinterpreted. Some but not all landowners permit mountain biking on trails crossing their land. This has been clarified in the EA.	EA, Chapter 2.C, paragraph 8 reads "...use of these roads occurs by individuals who enjoy walking there, or mountain biking (<i>where</i>
50	28	Rec (Ski)	1	Iris Baird	Q: Do you plan to add Nordic Ski Trail in both Alternatives 2 & 3?	No. The proposed trail addition is in Alternative 3 and 4 only, and is not part of Alternative 2 or 5.	EA, Chapter 3.B - Description of Alternatives

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51	29	Rec (Ski)	3	Thomas Linell	Proposed Nordic Trail should be non-fee and avoid deer yards.	The proposed nordic trail was part of the Jackson Ski Touring Foundation's long range development plan and if approved would be constructed and maintained by them as part of their maintained and roomed trail system.	Regarding effects to deer yards and other habitat effects, see EA, Chapter 3.8, Effects to Wildlife
52	30	Rec (Ski)	11	Jerry Marceau,	Concerned with general impacts of proposed project to XC skiing.	The nordic trail system operated under special use permit by Jackson Ski Touring Foundation provides quality recreation access to thousands of users and, while some effects may be unavoidable, we hope not to displace skiers for an excessive period.	EA Chapter 3.1, Recreation Effects
53	30	Rec (Ski)	12	Beth, Kevin & Mary Gibson	Concerned with general impacts of proposed project to XC skiing.		
54	31	Rec (Ski)	7	Thom Perkins JSTF	Suggests that FS regulate timing of summer units in Alt.3 - should change to fall only to minimize road damage, safety concern.	While limiting harvest to the autumn months would appear to minimize impacts of logging activities on skiers in winter and summer recreation visitors, it would reduce the operating season to an unmanagably short period. Limiting hauling to the fall only would not allow sufficient time to responsibly manage the area, and would not necessarily reduce damage to town roads, since fall weather tends to be wet, causing roads to be softer. Regardless of the season of operation, the Than project will likely have an adverse effect on one group or another. Summer hauling affects residents on Carter Notch Road and recreation visitors, and has the greatest potential to damage the Town road. Winter hauling affects nordic skiing and Jackson Ski Touring Foundation business. Autumn can be wet. Little activity generally occurs during spring months due to spring break-up. There are issues associated with all four seasons. Potential road damage will be monitored and prevented through haul restrictions if needed.	"Fall hauling only" is not a viable alternative to be addressed in the EA (see section 2.D). For effects of project alternatives to nordic skiing, see EA Chapter 3.1 - Effects to Recreation - Nordic Skiing. For Safety see the second 'bullet' under design features in Appendix A and section 1.M, under issues addressed by Forest Plan Standards.
55	31	Rec (Ski)	22	Walter Yaceshyn	Timing of summer operations & winter logging accomodation is important to minimize effects to skiers.		
56	31	Rec (Ski)	23	Betsey Harding	Staged projects that alternate over years would work best & minimize impacts to skiing.		
57	32	Rec (Ski)	7	Thom Perkins JSTF	Requests that FS log west units 23-28 first, and then harvest east units to minimize ski area closures.	This concern was also expressed by several at the public meeting in Jackson Town Hall on February 13, 2006. Some effects to nordic skiing are unavoidable. The Forest will attempt to minimize effects to nordic skiing if possible. We will communicate with Jackson Ski Touring Foundation as the project progresses to address timing issues and opportunities, and make reasonable attempts to reduce impacts. However, it is unlikely that activities can be segregated and their schedules staggered in such a way that skiing opportunities are not affected.	Alternatives 3 and 4 in the EA were designed to partially mitigate effects to skiing. (EA section 2.B) Also see effects to nordic skiing by alternative, addressed in EA Chapter 3.1.
58	32	Rec (Ski)	15	Ken Kimball (MW Nordic Club)	Suggests FS log units 18-20 and 23-28 first, then east units (1-17) to allow alternate-year skiing.		
59	32	Rec (Ski)	16	Peter & Emily Benson	FS should do whatever possible to avoid long closures of ski trails.		
60	32	Rec (Ski)	24	Samuel Harding	Organize project & season of operations to maximize skiing on Boggy Brook Trail & Prospect Farm.		
61	33	Rec (Ski)	7	Thom Perkins JSTF	Suggests FS construct proposed parking area at Bog Brook Trail at beginning of project.		
62	34	Rec (Ski)	15	Ken Kimball (MW Nordic Club)	Recommend all units 1-28 be harvested outside of winter months (12/15 - 3/30)	The Forest will attempt to do this if possible, but cannot guarantee parking area construction will be able to precede the planned logging due to funding and timing limitations.	Not an issue to be evaluated in the EA.
63						A significant portion of respondents, as well as several commenters at the Feb. 13 public meeting, voiced concerns about summer and fall logging to public safety and potential road damage. To schedule 100% of the project for non-winter hauling would not recognize the concerns of others in the Jackson community.	Not an viable alternative to be addressed in the EA. See EA, Chapter 2.D. - "Alternatives Considered but Deleted from Further Study"

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64	35	Rec (Ski)	15	Ken Kimball (MW Nordic Club)	Suggests modification to Alt.3: (1) locate gate so skiers can park before gate, and (2) colocate Bog Brook summer parking with JSTF parking area to serve all seasons.	(1) The current location of the gate near the end of the paved portion of Carter Notch Road was suggested by the Town of Jackson, who have jurisdiction on the road. We will continue to work with the Town, as well as JSTF, to manage or change this as needed, if mutually agreeable. (2) The Bog Brook summer parking is planned in a location near the gated end of Carter Notch Road where it might better serve hikers onto both the National Forest and town land in the Prospect Farm area.	EA Chapter 3.1 - Effects to Recreation
65	36	Rec (Ski)	15	Ken Kimball (MW Nordic Club)	East Pasture Loop Trail should be one-way up & one-way down for skier safety.	A connection to East Pasture Loop Trail is proposed as a single corridor in Alternatives 3 and 4. Splitting it into two parallel one-way corridors was briefly discussed by the project team, but was not adopted. Issues of topography, land impact, and habitat effects make this proposal undesirable.	EA, Chapter 3.8 - "Effects to Wildlife Habitat"
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68	37	Rec (Ski)	16	Peter & Emily Benson	FS should consider a public XC ski route from FR 233 to Black Mtn. Trail.	This idea has merit and may be an option to consider to improve nordic skiing opportunities in the area. Although not included as part of any alternative, it may receive future consideration, but preliminary assessment indicates a direct sidehill route is infeasible due to several steep incised draws.	Not an alternative to be addressed in the EA.
69	38	Rec (Ski)	23	Betsey Harding	Leave culverts after the sale is complete to benefit X-C skiing.	This idea has merit and in fact has been agreed upon by the Forest Service, Jackson Ski Touring, and the Town of Jackson. Culverts will be left in FR 512 ("Quail Trail") after completion of the sale.	EA, Appendix A - Design Features & Mitigation Measures
70	39	Rec (Ski)	26	Justin Kermond	In favor of constructing parking area on Carter Notch Road for skiers.	The Forest Service will continue to work with the Town of Jackson and JSTF to address nordic skier needs and options along Carter Notch Road.	EA chapter 2.B alternatives, and Section 3.1 - Recreation effects
71	40	Rec (Trails)	28	Joan & Loren Billings	Concerned about possible increase to volume of trail use on the Black Mountain Trail, and impacts to their adjoining property	None of the actions proposed in this project involve the Black Mountain Trail, the cabin, the Black Mountain Trail parking area, or adjoining private property. Therefore, proposed actions are not expected to have any effect on recreation use of the Black Mountain Trail.	Not an issue to be evaluated in the EA.
72	40	Riparian	20	Frank Robey	There is a stream on the southeast side downhill from Unit 4. Forest Service should not be clearcutting within Riparian Zone (Forest Plan Pg. 2-24/25, G-2).	The commenter correctly cites standards and guidelines in the Forest Plan that constrain harvest activities in riparian areas and in proximity to perennial streams. Forest Plan Standards and Guidelines will be applied. There is no perennial stream evident on the map southeast of Unit 4, which is a high elevation unit.	EA, Chapter 3.4 and 3.5 addresses known and likely effects of all alternatives to Riparian and Aquatic Habitats

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73	41	Roads	2	Maryann Pike	Objects to gate/gate posts at edge of her property without her permission.	The gate referred to by this commenter was placed in the location directed by the Town of Jackson, who have jurisdiction on the Carter Notch Road. The exact location was selected and approved by the selectmen in October 2005. The gate and gateposts lie within the Town's right-of-way for the Carter Notch Road. This location is near where the town's plow truck turn around in the winter. We will continue to work with the Town to manage or change this as needed.	The town requested the gate as a way of minimizing road damage that might result when plowed through to NF during Than project . Not an action addressed in the EA.
74	42	Roads	3	Thomas Linell	Bridge Abutments on Ellis River should use natural rock facing for esthetics.	This proposal was discussed by the project interdisciplinary team, but was determined not to be necessary because there is little to no canoeing or other recreation use on this part of the Ellis River.	Not an issue to be addressed in the EA.
75	43	Roads	5	Phillip Sferes	Concerned about impacts of additional road traffic on peace & quiet on Carter Notch Rd. - noise, time of day, season, # of vehicles, type of vehicles, safety of children.	This concern was also frequently heard at the public meeting in Jackson Town Hall on February 13, 2006. Residents along the Carter Notch Road were generally concerned about summer hauling, and its possible effect on pedestrian safety. Road dust and traffic noise were also concerns. Numerous resident are seasonal residents who are in the area during the summer. Also, recreation visitation is high in Jackson during the summer, particularly in the Jackson Falls and Eagle Mountain House areas. Residents along the road generally prefer winter hauling over summer hauling. Some summer hauling will be necessary. Winter hauling will have impacts on the nordic skiing community who have voiced concerns as well. Some compromise is needed.	EA, Chapter 2.B: Alternatives 2 through 5 have varying seasons of operation, to respond to the issues of public safety, road damage, and impacts to Nordic skiing. See EA, Tables 2, 3, 4, and 5. Effects described in EA Chapters 3.1 and 3.11 - "Socio-Economics".
76	43	Roads	16	Peter & Emily Benson	Concerned about safety & speed of trucks hauling on Carter Notch Road.		
77	43	Roads	23	Betsey Harding	Concerned about safety along Carter Notch Road & logging trucks in summer / fall.		
78	43	Roads	24	Samuel Harding	Residents on Carter Notch Road concerned about summer hauling.		
79	43	Roads (Public Safety)	9	Roger Chambers	Summer residency along Carter Notch Rd is higher than winter, plus high recreational visitors. This means higher traffic & more safety issues if logged in summer.		
80	44	Roads	7	Thom Perkins JSTF	Relocate gate to a point that is past JSTF parking.	The location of the gate near the end of the paved portion of Carter Notch Road was suggested by the Town of Jackson, who have jurisdiction on the road. Our interest in installing the gate was to protect FS as well as Town roads from damage during spring break-up. We will continue to work with the Town, as well as JSTF, to manage or change this as needed, if mutually agreeable to all concerned.	Not an issue to be addressed in the EA.
81	45	Roads	9	Roger Chambers	Roads best suited for winter, especially Carter Notch.	This concern also came up at the public meeting in Jackson Town Hall on February 13, 2006. The upper part of Carter Notch Road (town road) after the pavement ends has some steep pitches, and winter hauling has been the norm on this road in the past. The Selectmen and Town of Jackson road agent have expressed the concern that the road is subject to less damage and erosion if used in winter rather than summer hauling.	EA, Chapter 2.B: Alternatives 2 through 5 have varying seasons of operation, to respond to public safety issues, road damage, and impacts to Nordic skiing. See EA, Tables 2, 3, 4, and 5. Effects described in Chapter 3.1 & 3.11.
82	45	Roads	13	Rose Buckingham	Resurfacing & drainage improvement is needed on Carter Notch Rd. to support proposed logging traffic.		
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84	46	Roads	10	Daniel Dinsmore	Concerned about level of proposed road improvement in Prospect Farm to units 18-20. Wants minimum road standard.	The minimum standard has also been requested by the Town of Jackson, and that is the Forest Service's plan. The road will be constructed to a low standard, which is the lowest FS Road standard.	EA, Chapter 2.B: Alternatives 2 through 4 describe a 'low standard' road for crossing Town of Jackson land.

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85	47	Scenic	7	Thom Perkins JSTF	Concerned about visual impact of unit 25 CC from Hall's Ledge.	Several respondents have noted the exceptional view of Mount Washington from Hall's Ledge Overlook and ask that the viewshed be preserved. They express concern that a planned clearcut in Unit 25 may impair the visual quality of this outstanding scenic overlook on the Hall's Ledge Trail. Based on photo analysis and computerized projections of planned harvests using the "Visual FX" software, the Project ID Team determined that harvest in Units 25 (cc) and 27 (thin) would not be seen from the Hall's Ledge viewpoint. At the most, the very uppermost 2-3 acres of Unit 25 clearcut may be visible just above the treetops. To allow for a margin of error, the team revised Unit 25 in Alternative 4 so that the uppermost 6 acres (named Unit 34) is a shelterwood.	EA, Chapter 2.B, Alternative 4 revises Unit 25 to provide a new shelterwood Unit 34. Also see Chapter 3.2 - Effects of Clearcutting on Scenery for an analysis by Alternative. Project file contains "Visual FX" renderings that illustrate the anticipated visual effects of harvest as viewed from selected viewpoints.
86	47	Scenic	13	Rose Buckingham	Harvest in Units 25 & 27 will adversely affect view from Hall's ledge.		
87	47	Scenic	24	Samuel Harding	Please preserve the Halls Ledge view shed.		
88	47	Scenic	15	Ken Kimball (MW Nordic Club)	Concerned about 29-acre clearcut (unit 25) and its visual effect from Halls Ledge Overlook- should be modified.		
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90	48	Soils	8	Pierce Beij	Concern about soil compaction resulting from summer logging & skidding - suggests we not limit winter hauling.	Protection of soils is one of the good reasons for, and advantages of, winter logging. Frozen ground and snow cover provide a layer of protection against soil compaction and erosion, especially in wet soils. For these reasons, we would prefer not to limit winter logging. However, as with many projects on NF land, there are other factors and public needs to be met in making management decisions. In the case of Than project, the FS has an interest in making an effort to minimize the impacts to a Special Use permittee who provides a valuable recreation opportunity to the public. Therefore, winter hauling is restricted on approximately 1/4 of the units.	For list of winter haul restrictions, see EA, Chapter 2, Tables 2,3,4,and 5, "Operating Season". Direct and cumulative effects of Alt's 2-5 analysis for soils are described in EA, Chapter 3.3.
91	48	Soils	9	Roger Chambers	There are wet/poorly drained soils in 2/3 of harvest areas. This area is best suited for winter harvest.		
92	49	Soils	14	Renee Voss (Sierra Club)	EA should include adequate discussion of soil impacts - erosion, compaction from skidders.	We agree. Direct and cumulative effects on soils is addressed in the EA.	Direct and cumulative effects of Alt's 2-5 analysis for soils are described in Chapter 3.3, & see Appendix A.
93	50	Soils	16	Peter & Emily Benson	Units 25 & 27 seem like long skids.	Long skids is an unfortunate fact of life for loggers on the White Mountain NF. The challenging terrain and our practice of minimizing road construction sometime creates situation where long skids of up to a mile or more are necessary. Such is the case with these units. Timber sale operators must factor this in when bidding on NF timber sales.	EA, Chapter 3.3 - "Soils" describe effects of skidding on soils. Also see section 3.4 - Water Resources, and Appendix A.
94	51	Soils Timber	16	Peter & Emily Benson	Units 4,5,14, & 17 are very long skids.		
95	52	Wild & Scenic River	14	Renee Voss (Sierra Club)	Project will have an adverse effect on Wildcat WSR, AT & SPNM areas. Cites stream crossings of Wildcat to access units 21 & 22.	It was noted that the triangle-shaped area within which Units 21 and 22 exist is surrounded by an MA 6.2 Semi-Primitive Non-Motorized area on one side and by MA 8.6 Wild & Scenic River on the other two sides. The project ID team discussed that this situation puts the triangle in an awkward place for active management. Therefore, it was determined that Units 21 and 22 should not be included in Alternatives 4 or 5. It was furthermore discussed that this triangle might be an area for which to propose a Management Area change or swap in a future Forest Plan revision.	See EA, Chapter 2.B - Units 21 and 22 are not included in Alternatives 4 and 5. Also, effect analysis in Chapters 3.1, 3.6, and 3.9 describe effects of all alternatives on Recreation, Wild & Scenic Rivers, and on Roadless/Wilderness.
96	52	Wild & Scenic River	16	Peter & Emily Benson	Given their proximity to Wildcat Brook units 21 & 22 should be deferred.		
97	52	Wild & Scenic River	20	Frank Robey	Access to units 21 & 22 require skid trail & bridge crossing Wildcat Scenic River. Believes this is inconsistent with desired condition for Wild & Scenic River in the Forest Plan.		
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100	53	Water	5	Phillip Sferes	Family swims in Wildcat River - Will water quality, pristineness be effected?	No measurable or discernible effects will be apparent that far downstream from the project area.	EA Chapter 3.4 - Effects to Water Resources
101	54	Water	13	Rose Buckingham	Harvest on steep slopes may degrade watershed and habitat.	Proper project design, including regulating seasons of operation and other mitigation measures, would limit resource effects as disclosed in the EA.	See EA Chapters 3.4 (Water Resources), 3.7 (Aquatic), 3.8 (Wildlife) and Appendix A (Design Features Related to Water Resources)
102	55	Water	14	Renee Voss (Sierra Club)	EA should discuss sediment movement to stream.	We agree. Direct and cumulative effects on soil and water resources are addressed in the EA.	Chapters 3.3 (Soils), 3.4 (Water Resources) and 3.5 Aquatic and Riparian.
103	56	Water	25	Martha Benesh	Streams that appeared on "Popple Project" are not shown on "Than" maps. We are concerned about effects to Ellis River.	The streams shown on Than Maps in the Public Comment Package came from a different 'layer' in the database, and was not noticed until this comment came in. The correct 'layer' was used for the EA maps. Effects of road and harvest activities on Ellis River are described in sections 3.4 and 3.5.	See EA maps - Figures 3, and 5-10, and Ch. 3.4 - Effects to Water Resources.
104	57	Water/Soils	20	Frank Robey	How will streams be protected from skidders (erosion) (cites S & Gs in Forest Plan, Pg. 2-25, G-5, and G-6).	Forest Plan standards and guidelines will be implemented during project design and execution. The recommended setbacks from perennial stream will be observed. If not possible due to terrain, obstacles, or other issues, the FS will perform an appropriate analysis of the situation and make a decision, as required by the Forest Plan.	EA Chapters 3.4 -3.7 address effects of all alternatives. Appendix A describes Forest Plan design features protecting streams.
105	58	Wilderness	14	Renee Voss (Sierra Club)	Project will have significant adverse effect on wilderness character of Wild River IRA and therefore an EIS is required. (No CFR cited in the letter, but Wilderness Act quoted)	There are no Wilderness or Wilderness Study Areas within the Wildcat or Ellis River HMUs. The Wildcat HMU lies entirely outside the proposed Wild River Wilderness. There are no legal or Forest Plan requirements for the Forest to continue addressing Wilderness attributes of inventoried roadless areas, now that the Forest Plan is completed and the ROD signed. The Forest Plan itself serves as the EIS that addresses this, and it has assigned portions of the inventoried roadless areas back to various Management Areas, including MA 2.1. All activities for Than are proposed in MA 2.1. The project is tied to the revised Forest Plan EIS. Another EIS is not needed.	EA, Chapter 1, Figure 2 - "Vicinity Map". Chapter 3.9-Wilderness /Roadless. See also WMNF Record of Decision, 9/13/2005, pgs. 23-26 - "Management Area Allocation".
106	59	Wilderness	19	Daniel Yetter (Friends of Wild River)	It is premature to plan activities in IRA prior to final wilderness boundary is designated fixed through legislation. Request the project be deferred.	The National Forest Management Act (NFMA) requires that the Forest Plan process be used to determine what, if any, inventoried roadless areas should be recommended for Wilderness designation, and to recommend its boundaries. The recently completed Forest Plan Revision produced two such areas. One was the Wild River area. The ROD signed on 9/13/2005 was not appealed. It was subject to implementation 30 days after the ROD was published. All proposals within the Than project are consistent with the revised Forest Plan. To defer implementation on just certain aspects of the Forest Plan would not be appropriate or defensible.	EA, Chapter 3.9 - Effect to Wilderness/Roadless. Also, Forest Plan EIS pgs. 385-406 - Wilderness. Forest Plan Appendix C - "Inventoried Roadless Area Evaluations"
107	59	Wilderness	21	Tom VanVechten	Proposed action for Than should be delayed until Wilderness bill is complete and the final Wild River boundary known.		
108	60	Wilderness	19	Daniel Yetter (Friends of Wild River)	All units within the Friends of Wild River Wilderness proposal should be removed. (includes units 11-22, 25, 29-33, 10, & 27)	The EA includes analysis of an alternative (Alt. 5) that excludes most of the same units cited in this respondent's letter. Effects analysis in the EA addresses comparatively how this and other alternatives address the Purpose and Need for Action, and how effectively they implement the WMNF Land & Resource Management Plan.	1. EA Chap. 2B. (Alternative 5) proposes no harvest or road activities within the area identified in this letter. 2. See EA, Chapter 3 - Affected Environment and Env. Consequences

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109	62	Wildlife	18	Jason Stock (NHTOA)	Desired condition for this HMU is 340 acres early successional habitat, and only 184 is proposed. You should add up to 156 more acres.	Alternative 4 was developed in response and proposes an additional 38 acres. While there is still potential to provide more early successional habitat, of the stands that would have met the category of being "optimum" for clearcutting, there are other Forest Plan constraints including opening size limitations, visual concerns, or adjacency to other openings.	See EA, Chapter 2B, Alternative 4. Tables 4 and 7 ("Comparison of Alternatives") EA, Chapter 3.8 - Wildlife Effects
110	63	Wildlife	18	Jason Stock (NHTOA)	HMU needs 2900+ acres additional spruce fir type for DFC. Recommend additional thinnings or overstory removals in high elevation spruce ELTs.	All the action alternatives include some softwood development objectives (see Tables 2-5, under "Treatment Objective"). Some alternatives are more aggressive than others. While we don't achieve the HMU objective in this project, we move toward it as the ecosystem and stand conditions allow. It is a gradual process as softwood regeneration establishes in first generation hardwood stands and slowly advance toward their natural successional types.	EA, Chapter 2B, Tables 2-5 and alternative descriptions. EA, Chapter 3.8 - Wildlife Effects
111	64	Wildlife	20	Frank Robey	There are numerous "woodpecker trees" throughout. Will you leave these for habitat?	Woodpecker holes are among the characteristics that can be indicative of nesting potential and are sought when selecting snags and den trees to be retained in any harvest areas. This is used as a guide when marking units for harvest.	Forest Plan, pg 2-35, "Wildlife Reserve Trees", S-2; and Glossary Pg.34:"Wildlife Trees" Also, EA, Ch. 3.8: Wildlife, and Appendix A - Mitigation Measures
112	65	Wildlife	21	Tom VanVechten	Effects analysis should include cumulative habitat effects of activities on nearby private land.	Direct and cumulative effects should and will be addressed in the EA, to include known activities on nearby private land.	EA, Chapter 3 - Affected Environment and Environmental Consequences
113	66	Wildlife	27	Bob Richardson	Wildlife will benefit from browse & cover provided by clearcuts.	We concur. The Purpose and Need for Action includes these beneficial wildlife habitat effects produced by clearcutting.	EA Ch. 1E - Purpose & Need EA, Ch 3.8 - Wildlife Effects
114	67	Wildlife (MIS)	14	Renee Voss (Sierra Club)	MIS viability & MIS habitat should be addressed in EA.	The revised Forest Plan (2005) included a Forestwide Species Viability Evaluation (SVE) which was completed to identify species of concern for the White Mountain NF. The SVE comprehensively examined species known to have viability risks on the Forest. The species of concern specific to the Than project are summarized in section 3.8.2 in the EA, and also is addressed in Appendix B. The revised Forest Plan identified five Management Indicator Species (MIS) on the WMNF, none of which are a species of concern. References to these five MIS species can be found in the EA.	EA, Chapter 3.8.1 - Direct & Indirect Effects on Wildlife Habitat; Chapter 3.8.2 - Species with Potential Viability Concerns; including TEPS and RFSS species, and Appendix B - Species Viability Evaluation.
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