White Mountain National Forest

United States
Department of
Agriculture

Forest
Service

**Eastern
Region**

Mill Brook Project

Final Environmental Assessment

Town of Stark
Coos County, NH

Prepared by the
Androscoggin Ranger District
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Cover: A typical northern hardwood stand in the Mill Brook project area.

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Chapter 1: Purpose and Need

1.0 Introduction

The Forest Plan

The proposal presented in the following site-specific analysis has its roots in the White Mountain National Forest's *Land and Resource Management Plan*, also known as the *Forest Plan*. Our Forest Plan was approved in 2005 after several years of extensive environmental analysis and collaboration with the public. Thousands of people representing a variety of interests, sciences, and specialties joined in the effort by way of public meetings, discussions, document reviews and comments, and scientific study to create what is now our 2005 Forest Plan. The Plan is a programmatic framework which documents the agreed-upon balance of multiple uses to meet society's needs while protecting, restoring, and enhancing our natural resources.

The 2005 Forest Plan may be amended at any time. It guides our land management for the next 15 years, when it will be revised again. Until then we will use the management framework of the 2005 Forest Plan to achieve our goals, objectives, and vision of the desired conditions for the White Mountain National Forest.

Implementing the Vision of the Forest Plan: The Mill Brook Vegetation Management Project

A team of resource specialists examined the Mill Brook area to assess the current conditions and identify any potential management activities that would move this area closer to the desired conditions described in the Forest Plan. The team decided to propose vegetation management to diversify wildlife habitat and promote a sustained yield of timber products, as well as to conduct two watershed restoration projects in eroding locations along Mill Brook. It also made sense to look at the road system in the area and propose which roads are necessary for long-term management, and which should be decommissioned. On-going field surveys, site-specific data collection, and public involvement helped refine the site-specific proposals and develop alternatives. This document presents the results of the environmental analysis. The Project File contains the supporting data, science, and other information associated with this analysis. Field survey and observations were an important part of project development.

This proposal is a revised version of the original proposal presented to the public in March 2006. Court rulings late in 2006 (in consolidated cases California v. USDA and Wilderness Society v. USFS) reinstated the 2001 Roadless Area Conservation Rule (RACR). The RACR prohibits road construction and timber harvest in inventoried roadless areas identified in the RACR, except in narrow circumstances. The original Mill Brook project proposal included about 1,500 acres of forest management and 0.9 miles of connected road construction in the RACR Kilkenny Inventoried Roadless Area. The proposed activities do not meet the exceptions allowed in the RACR. Therefore, we were required to revise the proposal to exclude those acres. The new project is described in Chapter 2, Section 2.2.

The land base of the Forest is divided into Habitat Management Units (HMU) as a tool to ensure that habitats are well-distributed across the Forest. HMUs contain a variety of habitat and land types in a mix of Management Areas, and provide a framework for

analyzing project impacts to wildlife habitat at a local scale. The Mill Brook project is located in the Mill Brook HMU.

Within each HMU there are compartments, which are smaller subdivisions of forest area used for orientation, administration, and silvicultural operations. Distinct features such as rivers, ridges, and roads define compartment boundaries.

The Mill Brook project area consists of Compartments 2, 3 and 4 of the Mill Brook HMU in the Kilkenny region of the White Mountain National Forest. See Map 1 in Appendix A. The project is located in the Mill Brook drainage in the Town of Stark in Coos County, NH, on moderately sloped terrain ranging from approximately 1,300 to 2,300 feet in elevation. The forest stands proposed for treatment are northern hardwood, mixedwood (a mix of hardwoods and softwoods), and spruce-fir types.

Management Areas

The Mill Brook HMU is comprised of three of the 15 Management Areas (MA) which the Forest Plan allocated across the White Mountain National Forest. Each Management Area emphasizes particular goals, objectives, and desired conditions as described below. Each MA has a set of standards and guidelines that set parameters on activities to ensure protection of the character of the land and goals assigned to the MA.

The 17,000-acre Mill Brook HMU includes the following Management Area allocations:

MA 2.1: General Forest Management (9,000 acres) allows for a range of uses and activities, including timber harvest, roads, motorized recreation such as snowmobiling, and developed areas such as campgrounds. MA 2.1 is described in the Forest Plan on pages 3-3 through 3-8.

MA 6.1: Semi-Primitive Recreation (170 acres) emphasizes non-motorized recreation, but allows motorized trail use in winter. Development levels are kept low, and scheduled commercial timber harvest and new Forest Roads are not allowed. MA 6.1 is described in the Forest Plan on pages 3-19 through 3-22.

MA 6.2: Semi-Primitive Non-Motorized Recreation (7,830 acres) maintains a sense of remoteness in a relatively undisturbed landscape. Timber harvest and roads are prohibited. MA 6.2 is described in the Forest Plan on pages 3-23 through 3-26.

MA 6.1 and 6.2 are simply within the analysis area defined by the interdisciplinary team for this project. No ground disturbing or other actions would occur within these areas. All proposed activities in Alternatives 2 and 3 are located in MA 2.1 and are designed to meet the goals and objectives for General Forest lands.

Key features and detailed information about resources in the Mill Brook project area are described in the "Affected Environment" sections in Chapter 3.

This environmental assessment (EA) describes our proposed action and two alternatives to it, as well as the affected environment and the predicted direct, indirect, and cumulative environmental effects that would result from implementing the proposed action or the alternative actions. Many resource specialists studied the proposals as the project was refined throughout the environmental analysis.

Tiering to the Forest Plan

This EA is tiered to the Record of Decision (ROD) for the Forest Plan and its Final Environmental Impact Statement (FEIS) (USDA Forest Service 2005a, 2005b, 2005c). Tiering is used when information and analysis in those programmatic documents applies to this project-level analysis and can be incorporated by reference into this EA, which can then remain focused on site-specific issues. Specifically, this analysis tiers to:

- The resource goals and objectives described in Chapter 1 of the Forest Plan;
- Forest-wide Standards and Guidelines in Chapter 2 of the Forest Plan;
- Management Area direction consisting of Purpose, Desired Condition of the Land, and Standards and Guidelines described in Chapter 3 of the Forest Plan; and
- Resource information and effects analyses in the FEIS.

Tiering is defined and encouraged in the implementing regulations and policy for the National Environmental Policy Act (40 CFR 1502.20, 1502.21; FSH 1909.15 11.41).

1.1 Purpose of the Action and Need for Change

The **purpose** of this project is consistent with resource objectives for MA 2.1 lands in the Mill Brook area, specifically addressing riparian and aquatic habitat, transportation (roads), vegetation, water resources, and wildlife habitat (USDA 2005a, pp 1-15 to 1-22).

The **need for change** is identified by comparing the existing conditions on the ground with the desired conditions as described in the Forest Plan. Management activities are designed to either maintain existing desirable conditions, or help move the land closer to those desired conditions.

Vegetation

The desired condition for vegetation as set forth in the Forest Plan calls for management using an ecological approach to provide both healthy ecosystems and a sustainable yield of high quality forest products, such as sawtimber. Management for commercial products uses integrated prescriptions that protect biotic and abiotic resources and are compatible with the high level of recreation use on the Forest (USDA 2005a, p 1-17 and 3-3). Harvest prescriptions will consider land capability to promote species best adapted to specific sites. Land capability is the inclination of the land to grow a particular forest type given the soils, climate, geology, aspect, and elevation of the site.

Need for Change – Vegetation

Field examination by resource specialists have identified harvest opportunities in many of the stands in the project area. Harvest prescriptions have been developed that will promote the desired conditions regarding healthy forests while providing a mix of sawtimber and pulp volume for local markets.

Mature stands in the project area contain a mix of large and small trees of varying quality. Opening up the canopy by removing some of the suppressed, lesser quality trees would enhance growth on the remaining trees and encourage desirable species to regenerate.

Timber harvest in identified mature stands would promote the health and vigor of the residual trees. In areas where the forest is dead or dying because of damage from the 1998 ice storm, clearcuts or group cuts are proposed to harvest what is merchantable and to promote the regeneration of healthy new stands. Ice damage occurs in Stands 2-10, 2-35b, 2-35a, 2-63, 2-34b, 2-34e (see Map 2).

All proposed harvesting has a site-specific objective to meet desired conditions for either wildlife habitat or vegetation; in many instances, harvest prescriptions are designed for both. The stands, harvest treatments, and management objectives are described in Chapter 2, Section 2.2 and Table 1.

The types of treatments and actions proposed in the Mill Brook project have been successfully implemented elsewhere on the Forest for decades. The vegetative responses to the prescribed treatments are predictable in bringing about the desired conditions, and adverse effects are minimized through careful project design and application of protective measures (see Section 2.5).

Wildlife Habitat

Regional literature and experts indicate that maintaining populations of wildlife and plant species native to northern New England means providing a wide variety of habitats across the landscape, including various forest types, age classes, and non-forested openings. These forest habitat types (softwoods, northern hardwood, etc.) and structural characteristics (mature forest, brushy openings, etc.) provide essential habitat for various wildlife species in New England (DeGraaf and Yamasaki 2001). The Forest Plan established Forest-wide habitat composition and age-class objectives that provide habitat diversity (USDA Forest Service 2005a, Chapter 1, pages 20-21). These goals and objectives are based on an interdisciplinary discussion about the natural history and habitat requirements of the wildlife species that inhabit the Forest and the land capability and disturbance patterns that influence forest habitat across the Forest. A detailed description of wildlife natural history and the ecological perspective used during Forest Plan Revision to develop habitat goals and objectives is available in "White Mountain National Forest Ecological Approach" (USDA Forest Service 2002b) and the Forest Plan FEIS (USDA Forest Service 2005b, Chapter 3, pages 73 – 112, 166 – 207).

The White Mountain National Forest uses Habitat Management Units (HMUs) as a tool to ensure that there is a connection between landscape-levels goals and objectives and project-level ecological conditions during project development. Input from internal and external forestry and wildlife experts supported the HMU approach as a reasonable way to help the forest achieve our habitat objectives. A more detailed discussion of the role of Habitat Management Units in achieving the desired future condition is available in the "Terrestrial Habitat Management Reference Document" (USDA Forest Service 2007).

Need for Change – Wildlife Habitat

A preliminary review of the Mill Brook HMU based on forest inventory, a review of historical records, and a review of databases and maps shows the current distribution and abundance of forest types and age classes (Mill Brook HMU Table in Project File). Most of the forest in the Mill Brook HMU is mature. The desired condition for the Mill Brook HMU is to maintain forest habitat in a variety of age classes (USDA

Forest Service 2005a, Chapter 1, pages 20-21). Currently, there is very little regeneration forest habitat in the Mill Brook HMU. The desired condition in this HMU is to increase regeneration forest habitat, which is defined (USDA Forest Service 2005b, Glossary, p. 23) as forest where most of the mature trees are 0-9 years old with less than 30 square feet of basal area in mature overstory. These data also provide information on land capability in the Mill Brook HMU. This analysis found that there is an abundance of northern hardwoods and mixedwood forest habitat types growing on sites that have soils that favor spruce-fir. The Forest Plan indicates that we should strive to have habitat type match land capability on a majority of our lands (USDA Forest Service 2005a, Chapter 1, pages 20-21). As a result, the desired condition for this HMU is to increase the amount of spruce-fir forest (Mill Brook HMU rationale document in Project File). Most of the aspen-birch habitat in the Mill Brook HMU, which is a less common habitat type, is mature and will start to succeed to northern hardwoods or spruce-fir habitat in the next decade without some type of disturbance. The desired condition for this HMU is to maintain aspen-birch at its current level (Mill Brook HMU rationale document in Project File). Finally, existing permanent wildlife openings will be expanded, created, and maintained where possible.

The interdisciplinary team identified stands in the Mill Brook HMU through site specific field reviews where silvicultural treatments could meet short term goals of that create northern hardwoods regeneration age forest habitat, maintain aspen-birch as a habitat component, expand permanent wildlife openings, as well as meeting the long term habitat goal of increasing spruce-fir in the Mill Brook HMU.

Riparian, Aquatic Habitat, and Water Resources

Surface waters on the White Mountain National Forest are considered "outstanding resource waters" and water quality is maintained or improved to protect or restore existing instream and riparian resources and values. The Forest Service manages streams at proper functioning condition to dissipate energy associated with high water flows, thereby decreasing erosion, reducing flood damage, and protecting water quality. The desired condition for watersheds is to continue to provide high quality water for aquatic biota and other purposes (USDA Forest Service, 2005a, pp 1-15, 1-17 to 1-18). All project activities address the need to maintain, protect, or enhance water quality through the application of Forest Plan standards and guidelines, Best Management Practices, and project design features.

Need for Change — Riparian, Aquatic Habitat, and Water Resources

Two locations in the Mill Brook drainage require restoration work to fix eroding roads immediately adjacent to the brook, restore the floodplain in the area of the Old Road, and prevent the main channel from shifting onto Road #2204. These roads were constructed prior to Forest Service ownership.

In 2005, a Stark resident informed Forest Service staff of erosion occurring the Old Road that parallels Mill Brook approximately 1000' south of the residential area in Stark. Forest Service staff completed a thorough field review of the area and determined the cause of the erosion along the road. A side channel from Mill Brook, that flows intermittently, was plugged with cobbles and boulders to prevent floodwaters from enter the side channel. Evidently this was done by Stark residents in response to a flood in the 1990s. High river flows in recent years are now being forced to flow down the road, causing it to erode, before water eventually flows back into the side

channel down-slope of the plug. There is a risk that another large flood could cause the road to become a new side channel, adjacent to the existing natural side channel, causing excessive soil loss from the National Forest and sedimentation into Mill Brook, which in turn may exaggerate flooding impacts downstream. There is a need to prevent the old road from further eroding by allowing high flows to access the existing side channel and restoring floodplain function within the old road bed. Restored floodplain function would promote storage of water and sediments rather than the erosion of compacted and un-vegetated soils.

Forest Service staff explored additional areas where old roads paralleled Mill Brook to determine if further erosion was occurring. An additional site was located where Mill Brook has completely eroded a section of an old road into the brook. There is a need to restore floodplain function to this site also.

The restoration projects are noted on Map 2 and proposals to address this need for change are described in Chapter 2, Section 2.2.

Transportation (Roads)

The desired condition for our Forest Roads is to provide a safe, efficient, and seamless transportation and parking network that allows for current, continued, and projected management, use, and enjoyment of the Forest. As funding is available, roads not needed to meet management objectives will be decommissioned, and those retained will be maintained to meet Forest standards and the requirements of the Highway Transportation Safety Act (USDA 2005a, pp 1-16 to 1-17).

An analysis of the existing road system in the Mill Brook project area was conducted to determine the need for retaining or decommissioning roads or road segments (Roads Analysis in project file). Roads needed to meet long-term management objectives will be retained and included as Forest Roads in our Forest database, while unneeded roads will be decommissioned and removed from the Forest Roads database.

Need for Change — Roads

Road Classifications: Our analysis considered 13.2 miles of road in the project area. We presented classification and decommissioning proposals to the public that indicated a need to retain most roads for long-term management, and to decommission about 2.4 miles of existing road. Part of this effort will be to adjust the Forest Roads database to reflect what exists on the ground as well as any changes in road classifications.

Restoration Maintenance and Landings: Maps 2 and 3 show roads and landings needed for logging operations and timber haul. No new road construction is needed, however existing roads -- FR 11A, FR 200, Road #2203, U-0014, and Old Road (southern segment) -- will require some maintenance such as brushing, grading, gravel, and drainage work to restore them for use. A temporary bridge placed on existing abutments on FR 200 will be needed. Seven existing and five new landings will be needed to efficiently accommodate proposed harvest.

Maintenance of FR 11E: This road is not needed for project activities but it is in need of maintenance to reduce the potential for erosion into a nearby stream. Camp owners on the road have done periodic maintenance through the years although it is a Forest Service road.

This is an example of a road that would be restored for use during harvest operations. This segment of Forest Road 11A is near Stand 2-35a.

1.2 Decision to be Made

The District Ranger examined this environmental analysis and considered public input to make an informed decision about which alternative, if any, to implement. She considered the following:

1) **Are there additional issues and/or alternatives that should be analyzed in detail?**

   The District Ranger considered this question at several points throughout the analysis. Any early resource concerns or issues raised by the interdisciplinary team were addressed in designing the original proposed action. Although the project was refined as the analysis and field work continued, no significant issues that would warrant a new alternative were identified by the team.

   However, in response to a number of public comments related to proposed activities in the Kilkenny Inventory Roadless Area (IRA), an alternative that eliminates all proposed harvesting and road work in the IRA was developed and analyzed. This became Alternative 3.

   Public review and comments included requests for several additional alternatives as follows:

   - Decommission all roads.
   - Use uneven-aged management only.
   - Separate the watershed projects from the rest of the proposal.
   - Develop an alternative similar in scope to Alternative 2 but outside of the Kilkenny IRA.

   The District Ranger considered these potential alternatives but did not conduct detailed studies because they either were not feasible or would not meet the purpose and need for the project as identified in Section 1.5.

2) **Which of the alternatives would best move the Mill Brook project area toward the desired condition of the land as outlined in the Forest Plan and described**

in the site-specific purpose for the project and need for change? Which of the alternatives best addresses relevant issues raised by the public and the Interdisciplinary Team?

3) **Would the Proposed Action and its alternatives pose any significant environmental impact to warrant the need for further study in an environmental impact statement?**

1.3 Public Involvement

The Mill Brook project was first published on the quarterly Schedule of Proposed Actions on January 1, 2006. The original Mill Brook proposal (March 2006) was presented to approximately 250 interested groups and individuals, including abutters, federally recognized tribes in the State of Maine and local Native American individuals, local newspapers, and various agencies and organizations. It was also posted on the Forest website at <www.fs.fed.us/r9/forests/white_mountain/projects/projects> and email notification was sent to approximately 800 interested groups and individuals. This notification was followed by a public field tour in June 2006 to seek further public input. The group visited the watershed restoration site near Stark Village, and examined several of the proposed harvest areas, including a proposed expanded permanent wildlife opening. They also hiked part of the Unknown Pond Trail to discuss trailside harvest options in the area of stands proposed for treatment in the original proposal. A second field trip in July 2006 examined views of the project area from Roger's Ledge, a viewpoint located to the southeast of the project area.

In a March 2006 meeting with the Town of Stark Selectmen, they voiced concerns about erosion along Mill Brook in the area of the Old Road, and past and potential flooding of Stark Village during high water events. They also mentioned hiking and

Public field tours helped refine the Mill Brook Project proposals.

snowshoeing use of the Old Road adjacent to Mill Brook by students from the Stark Elementary School.

Comments received during the 2006 scoping period were instrumental in the early stages of identifying issues and developing possible alternatives to the proposed project. This input helped design the updated Mill Brook project that was distributed for public scoping in February 2007. This revised project was scoped the same way as the first proposal: hardcopy mailings, website posting, and email notifications. We received 26 responses that were examined for significant issues, new information, and potential design features. Comments and Forest Service responses are in Appendix B.

The Forest Service met again with the Town of Stark Selectmen in July 2007 to review the changed harvest proposal, visit the lower watershed restoration project, and discuss the history and potential for flooding in the Village during high water events. A summary of that meeting is in the project file.

The Preliminary EA for the Mill Brook project was available for public review and comment from February 28, 2008 through March 31, 2008. The document was distributed to those who had previously commented or expressed interest in the analysis. Email notification was sent and the document was posted on the Forest website for the formal 30-day comment period. A legal notice announcing the formal 30-day comment period was published in the *New Hampshire Union Leader*. This review period gave the public another opportunity to comment on our project and the environmental analysis with the predicted effects of the three alternatives. The comments we received in this time were used to strengthen our analysis, address new areas of concern, make minor corrections and clarifications, and complete the project record. Public comments and Forest Service responses are in Appendix C.

1.4 Issues

On-going field examinations, monitoring, data analysis, discussion by resource specialists, and public input helped the Interdisciplinary Team (IDT) refine the project proposal. Most concerns were addressed through minor modifications of the Proposed Action and the development of project *design features* intended to protect resources and provide for public safety where necessary (Section 2.5). Concerns that could not be resolved through small changes or design features were identified as "issues" and were used to develop alternatives to the Proposed Action.

Public involvement played a key role in developing alternatives. Some respondents expressed concern that timber harvest and road construction in the Kilkenny Inventoried Roadless Area (IRA) would adversely affect the IRA, reducing the size of the area that will meet roadless inventory criteria in the future (see scoping comments and responses in Appendix B).

This public concern led to the formation of Alternative 3: **No Harvest in 2005 Kilkenny IRA**.

1.5 Alternatives Considered but Not Analyzed in Detail

Uneven-Aged Harvest Only

One member of the public requested that we harvest only with uneven-aged management methods in order to maintain mature stands with a sustainable flow of products every 20 years. We did not fully develop and analyze this alternative because such an alternative would not provide the balanced mix of wildlife habitats envisioned in the Forest Plan. No northern hardwoods regeneration forest habitat would be created, nor would we be able to manage the softwoods site to perpetuate spruce-fir habitat for wildlife. Even-aged management is the optimal method for creating regeneration forest habitat and releasing the existing softwood regeneration. Eliminating even-aged management therefore would not meet our Forest goal of providing regeneration forest habitat or perpetuating spruce-fir habitat, nor would it meet the Need for Change in the Mill Brook HMU.

Decommission all Roads

One respondent requested that the Forest Service develop an alternative that would close and decommission roads in the Kilkenny IRA in the project area as well as Roads 2205.2, 2205.1, FR 200, FR 199, and the southern end of FR 11 (Mill Brook Road). The commenter stated that closing these roads is necessary to protect riparian habitat, stream functioning, and the character of the Kilkenny IRA. Some segments of those roads are proposed for closure and decommissioning in Alternatives 2 and 3 because they are not needed for long-term management in the area. Sections 3.3, 3.5, and 3.12 discuss the current road conditions in the project area and the predicted effects on fish and aquatic habitat, the character of the IRA, and water resources, with no measurable effects predicted. Roads 2205.1 and 2204 are private roads that we cannot close and decommission; we are proposing to classify them in the database for any potential use in the future.

We did not fully develop or analyze this alternative because an alternative that decommissions all roads is not viable given the results of the Mill Brook Roads Analysis, which considered the need for each road in the project area. The fact is that particular roads are necessary for the purpose of this project as well as long-term management and public access of the Mill Brook area. The Roads Analysis (located in the project file) identifies the minimum road system needed in this area of the White Mountain National Forest

Watershed Projects Only

One respondent requested that we consider an alternative that includes only the two watershed restoration projects so that the work would not be delayed by appeals or litigation aimed at proposed timber harvest and road work in the Kilkenny IRA. When the analysis is complete, we could consider making separate decisions for the "Other Proposed Activities" (Section 2.2). However, a separate alternative with just the watershed restoration projects in this analysis would not address the purpose for the Mill Brook project and the need for change.

Similar in Scope to Alternative 2, but Outside of the 2005 Kilkenny IRA

One respondent requested an alternative be developed that would be more comparable (than Alternative 3) with Alternative 2 in terms of board feet, unit costs, and net value, while still avoiding logging in the Kilkenny IRA. The commenter noted that there are 9,000 acres of MA 2.1 land in the Mill Brook HMU, and as such, there should be ample available acres on which to harvest timber.

In reality, of these 9,000 acres, about 6,000 are in the Kilkenny IRA, leaving less than 3,000 acres outside of the IRA available for harvest.

A feasibility report created in July of 2005 for the Mill Brook proposal included a database analysis indicating the MA 2.1 lands in the Mill Brook area as one of the larger blocks of land on the Androscoggin Ranger District with conditions right for vegetation management and improvements to wildlife habitat diversity. Project planning began and the original proposed action of harvest on more than 2,300 acres was released for public scoping in March of 2006. This acreage was later scaled back to the current plan of 1,034 acres. Both of these proposals included timber harvesting on the MA 2.1 lands within the HMU, as suggested by the commenter. The harvest area (1,034 acres) as it exists today is the result of considerations by resource specialists, past harvesting activity, existing and desired habitat composition, operational concerns, numerous meetings with the public and meeting Forest Plan goals and objectives.

An alternative that harvests similar volume as Alternative 2 but outside of the IRA in the Mill Brook HMU is not feasible at this time. As noted above, all of the forest stands on MA 2.1 lands in the Mill Brook HMU were examined in the early phases of the Mill Brook project development. Most stands with appropriate age class and stocking for harvest were identified and presented as part of the Mill Brook project proposal in 2006 and/or 2007. Those stands that have appropriate conditions for harvest but were not proposed for harvest may have access or topography concerns and are deferred at this time. In general, stands may also be deferred because they are adjacent to recent harvests, or may have visual or other resource concerns, or ground-checking identifies them as unsuitable for timber management, as in the case of Stand 2-38. As the commenter notes, there are many acres in the HMU outside of the Kilkenny IRA, but very few support stands of the age and stocking appropriate for harvest.

Chapter 2. Alternatives

2.1 Alternative 1: No Action

While this alternative does not meet the Purpose of the Action and Need for Change, it does provide a basis for analyzing the effects of conducting no management activities in the project area, and comparing these effects with alternatives that do propose management activities. This alternative is required by regulations implementing the National Environmental Policy Act (NEPA). There would be no change to the existing condition except from natural occurrences: no harvest of trees, increased acres and maintenance of the permanent wildlife openings, work or administrative changes to the road system, or watershed restoration in the Mill Brook drainage. Choosing this alternative would not preclude proposing activities in this area later.

2.2 Alternative 2: Proposed Action

See Map 2. The Mill Brook project would harvest timber on approximately 1,034 acres, which is about 17% of MA 2.1 lands in Compartments 2, 3, and 4 of the Mill Brook Habitat Management Unit (HMU). The current proposal differs from the scoped proposal (February 2007) in the following ways:

- Stand 2-38 was dropped due to difficult operability of the rocky terrain. The result is a decrease of about 32 acres and 225 thousand board feet (MBF) of timber volume in the current Proposed Action from the scoped proposal.
- Final landing locations may differ from the mapped locations scoped in February 2007. The Forest Service Timber Sale Administrator will approve final locations with all relevant Forest Plan standards and guidelines applied to ensure resource protections. In particular, the landing on the south side of Stand 2-30 would likely be located nearer to Stand 2-29a, and the landing on FR 11A would be located somewhere along that road other than its originally proposed location.
- To allow for flexibility and efficiency in harvest activities while still emphasizing natural resource protection, operating seasons are defined by ground conditions and seasons. Operations within an assigned season will be permitted when the ground conditions continue to meet objectives such as soil and water protection or site preparation for seedbeds. For example, a winter harvest could occur early or late in the season if the ground is frozen, and a summer harvest could occur earlier or later if the ground is dry. As usual, operations would cease whenever necessary to protect resources. Operating seasons assigned for other resource reasons such as protection of nesting wildlife would remain as set by the biologist or other resource specialist.
- Operating seasons were changed on two stands: Summer harvest was added to 3-13a because it is a clearcut and therefore there is low risk of bark damage on residual trees; summer harvest was removed from Stand 2-59 (thinning) to minimize bark damage on residual trees.
- The harvest prescription for Stand 2-24 was changed from individual tree and group selection to group selection only because the objective in that stand is to open up small canopy gaps to perpetuate the spruce-fir habitat type.

Table 1 lists the stands, type of harvest, approximate acres, season of operation, and harvest objectives.

The estimated total volume harvested in Alternative 2 is 3,520 thousand board feet (MBF).

Map 2 shows the location of the stands proposed for harvest, as well as the location of other proposed activities for the alternatives.

Table 1. Alternative 2: Proposed Action Timber Harvest Proposals.

SO = Season of Operation (S: summer, F: fall, W: winter). Operations could begin early or extend beyond the normal season if ground conditions allow (i.e., ground is dry or frozen).

Rx = Stand Harvest Prescription

111….Patch Clearcut	**141**….Overstory Removal
113….Clearcut	**152**….Group Selection
210….Improvement Cut	**153**….Individual Tree Selection and Group Selection

Stand	Cover Type	Acres*	SO	Rx	Treatment Objective
2-10	Northern Hardwood	29	F/W	153	Enhance within-stand diversity
2-12	Northern Hardwood	32	F/W	153	Enhance within-stand diversity
2-16	Northern Hardwood	83	F/W	210	Improve stand quality
2-19	Northern Hardwood	25	W	153	Enhance within-stand diversity and perpetuate spruce-fir
2-24	Spruce/Fir	32	W	152	Perpetuate spruce-fir
2-29a	Northern Hardwood	4	S/F/W	111	Permanent wildlife opening expansion
2-30	Northern Hardwood	56	F/W	153	Enhance within-stand diversity and perpetuate spruce-fir
2-34b	Northern Hardwood	29	F/W	113	Create northern hardwood regeneration forest habitat
2-34d	Northern Hardwood	113	F/W	210	Improve stand quality and perpetuating spruce-fir
2-34e	Northern Hardwood	204	F/W	152	Improve stand quality and perpetuating spruce-fir
2-35a	Northern Hardwood	18	S/F/W	113	Create northern hardwood regeneration forest habitat
2-35b	Northern Hardwood	81	F/W	152	Perpetuate yellow birch and spruce-fir
2-45	Northern Hardwood	84	F/W	153	Enhance within-stand diversity and perpetuate spruce-fir
2-59	Northern Hardwood	79	F/W	210	Improve stand quality
2-63	Northern Hardwood	21	F/W	153	Perpetuate northern hardwood
3-13a	Northern Hardwood	5	S/F/W	111	Permanent wildlife opening expansion
3-16a	Spruce/Fir	5	W	141	Release spruce-fir understory
3-31	Mixedwood	40	W	210	Improve stand quality
3-36	Northern Hardwood	47	W	153	Enhance within-stand diversity and perpetuate spruce-fir
4-15	Northern Hardwood	29	W	153	Improve stand quality
4-34	Northern Hardwood	18	W	153	Enhance within-stand diversity and perpetuate spruce-fir
TOTALS		**1,034**			

***Numbers are approximate**

Connected Actions

Connected Actions are those that are necessary to implement the Proposed Action.

Roads and Landings: No new road construction is proposed. Seven existing and five new landings would be required for timber harvest activities. Mill Brook Road (FR 11) would serve as the main access road, with further access to log landings provided by these existing spur roads:

FR 11A	FR 200
Road #2203	U-0014
Road #2400	Old Road (southern segment)

These roads would require some restoration maintenance to make them usable for hauling timber. Work would consist of removing barriers, installing temporary culverts, brushing, reshaping road surfaces, clearing ditches, graveling, and laying of geo-textile fabric. FR 200 would have a temporary pre-fabricated bridge installed on existing abutments.

After harvesting, the spur roads used for harvest (listed above) would be blocked again with either rock or earthen barriers, temporary culverts removed, waterbars installed, and the temporary bridge on FR 200 removed. FR 11A would be closed beyond the U-1003 junction. All landings would be closed with erosion control measures applied to protect resources.

Permanent Wildlife Openings: Maintenance of the two openings would be required every 3-5 years (subject to further environmental analysis for maintenance conducted 3-5 years after this analysis and a decision to implement one of the action alternatives). Stands 3-13a and the expanded 2-29a (includes existing 1 acre opening) would have the stumps removed (referred to throughout this analysis as stumping) to maintain or create the open habitat. The openings would be maintained through mowing, prescribed burning and/or hand brushing as funding is available.

Other Proposed Activities

Watershed Restoration

Two watershed improvement projects are proposed in the Mill Brook watershed. See Maps 2 and 3 for project locations.

A) The following is proposed to restore the floodplain along the Old Road:

- Obliterate and roughen (loosen up soil) with rocks and woody debris a 500-foot section of the road by placing wood along it to prevent the road from eroding into Mill Brook.
- Revegetate the old roadbed with native plantings and mulching.
- Lower rock plugs on side channels to relieve the main channel of high stream flows during flood events.
- Place large logs (12″-24″ in diameter) in a main side channel to facilitate sediment deposition (build up elevation) and prevent the side channel from becoming the primary channel.

- Remove old, undersized box culverts and round pipes from the northern segment of the Old Road to prevent plugging and potential washouts of the road.

B) Along 2204, the following is proposed to stabilize the road and prevent the shifting of Mill Brook's main channel to the road:

- Place wood in a small side channel (approximately 200 feet) that has formed on the roadbed. Woody material of various sizes would be obtained from the immediate area and be placed with hand crews and/or machinery.

Road Maintenance

FR 11E is not required for the timber harvest proposals, however this road is in need of maintenance and may be repaired while equipment is in the area for the Mill Brook project. The road condition is deteriorating and could potentially cause erosion into a nearby stream in the future. The work would be similar to the road restoration maintenance described for Connected Actions in Section 2.2. After the work is completed, FR 11E would remain open to allow access for camp owners and the general public.

Road Classification and Decommissioning

Specific roads proposals were included in the scoping report for public review (see Appendix B for public input regarding road classification and decommissioning). See Maps 2 and 3 for specific road classification proposals. Mileage and other details are in the Roads Analysis in the project file.

The Mill Brook Roads Analysis examined about 13.2 miles of road in and around the project area. Road segments not needed for present or future management activities were proposed for closure and decommissioning, with the remaining miles designated as Forest Roads with varying maintenance levels, depending on use. In addition, discrepancies in length, maintenance levels, and classification between the Forest Roads database and roads as they exist on the ground were identified and the database will be updated.

Segments of existing roads ranging from 0.02–0.70 miles in length and totaling about 2.4 miles would be decommissioned and removed from the roads database. Some of these road segments are nothing more than old skid trails or old bulldozed roads that were never engineered nor maintained for long-term use. Other segments were used at one time for timber management but are no longer needed. Basic road decommissioning techniques include blocking access to motorized use, removing culverts, restoring cross-drainages and wetlands, scarifying roadbeds, seeding, mulching, and restoring slopes. These and other techniques are described in detail in the FEIS on page D-16. Each road condition is different and will have a customized set of techniques applied. In some cases, because of the rapid growth of vegetation in the White Mountain National Forest, decommissioning may mean simply leaving the road to return to its natural state.

Some segments of roads currently listed as "unauthorized" roads would be re-classified as Forest Roads. These road segments are existing roads that are necessary for long-term management of the national forest.

2.3 Alternative 3: No Harvest in Inventoried Roadless Area

See Map 3. Alternative 3 responds to the issue raised by the public regarding the effects of harvesting on MA 2.1 lands in the inventoried roadless area (IRA). We developed an alternative that does not harvest timber in the 2005 Kilkenny Inventoried Roadless Area. The Kilkenny IRA was delineated during Forest Plan revision for the purpose of evaluating areas having potential for Congressional designation as Wilderness. The evaluation did not recommend the area for Wilderness and subsequently allocated the land to various management areas, including MA 2.1 which allows timber harvest and road work. See Appendix C of the FEIS (USDA Forest Service 2005b pp. C-92 to C-100) for details and results of the Kilkenny IRA evaluation.

Alternative 3 differs from Alternative 2 (Proposed Action) as follows:

1. There would be no timber harvest in Stands 2-10, 2-12, 2-16, 2-19, 3-31, 3-36, 3-13a, 3-16a, 4-15, and 4-34. This totals approximately 313 acres and 1,040 MBF. Of these 313 acres, 292 acres are within the IRA. The remaining 21 acres (western portion of Stand 4-15) outside the IRA would not be harvested under Alternative 3. This reduced timber harvest will result in a lost opportunity to enhance growth, yield, and forest health in those stands.
2. There would be no road restoration maintenance on FR 200 (0.2 miles), including installation of the temporary bridge.
3. There would be four fewer existing landings used: the three landings on the south end of FR 11 and the one at the end of FR 200 would not be required.
4. Because Stand 3-13a would not be harvested, the permanent wildlife opening would not be created and there would be no stumping or future wildlife opening maintenance.
5. The opportunity to enhance wildlife habitat diversity in several areas would be foregone. The permanent wildlife opening in Stand 3-13a would not be created. The opportunity to promote and nurture spruce-fir habitat in 2-19, 3-36, 3-16a, and 4-34 would be lost.
6. The estimated total volume harvested in Alternative 3 is 2,480 thousand board feet (MBF).

All other activities and design features not associated with the above changes would be implemented as described in Alternative 2.

The administrative proposals for roads classifications and decommissioning as described in Alternative 2 (Section 2.2) would remain.

2.4 Comparison of Alternatives

Table 2. Proposed Activities by Alternative

Activity	Unit	Alt 1 No Action	Alt 2 Proposed Action	Alt 3 Harvest Outside the IRA
Vegetation Management				
Clearcut (Regeneration Cut)	Acres	0	47	47
Patch Cut for Permanent Wildlife Openings	Acres	0	9	4
Group Selection Cut	Acres	0	317	317
Individual Tree & Group Selec-tion Cut	Acres	0	341	161
Overstory Removal	Acres	0	5	0
Improvement Cut	Acres	0	315	192
Total Area	Acres	0	1,034	721*
Harvest Volume	MBF	0	3,520	2,480
Permanent Wildlife Opening Maintenance				
Prescribed Burn, Handbrush, and/or Mow every 3-5 years	Acres	0	11	5
Transportation System				
Road Restoration Maintenance	Miles	0	3.5	3.3
Landings used: Existing/Con-structed	#	0	7/5	3/5
Road Decommissioning	Miles	0	2.4	2.4
Unauthorized Road Classified to Forest Road	Miles	0	3.1	3.1
Watershed Restoration				
Old Road Floodplain Restoration	Feet	0	500	500
Channel Stabilization near Road #2204	Feet	0	200	200

* 21 acres (the western portion of Stand 4-15–see Map 2, Appendix A) are dropped under Alternative 3. These acres are not in the IRA.

2.5 Design Features

All actions in the Mill Brook project have been proactively designed to meet particular management goals while protecting resources. There are three types of protective measures integrated into the Mill Brook project design:

1. Forest Plan Standards and Guidelines (USDA Forest Service 2005a Chapters 2 and 3).
2. State of New Hampshire Best Management Practices (New Hampshire and SPNHF 1997, New Hampshire 2001, New Hampshire 2004).
3. Design Features as described below.

Design Features define how and/or where particular Forest Plan standards and guidelines are applied to the project. They may also be management activities that are not

directly associated with standards and guidelines but will be implemented on the ground to address site-specific safety or resource needs. Design features are applied only if the affected area or stand is included in alternative ultimately selected by the District Ranger.

Air Quality

1. Notify the public prior to ignition of the prescribed burns in Stands 3-13a and 2-29a.
2. Reduce dust from trucking on Mill Brook Road (FR 11) if it becomes an air quality problem (as identified by Forest Service Timber Sale Administrator) by either spraying water or applying calcium chloride or magnesium chloride to the road. This is a proven method of reducing road dust.

Heritage Resources

3. Known heritage sites located in or near proposed activities will be protected by marked reserve areas. No harvesting or equipment would be allowed in the known heritage reserve areas. Monitoring the implementation of reserve areas in past timber sale harvests indicates that reserve areas are effective in protect heritage sites

Recreation

4. Place caution signs as necessary to alert visitors to logging operations.

Riparian and Aquatic Habitat

5. Apply Forest Plan standards and guidelines for perennial streams to the lower reaches of Peps Brook and Pucci Brook that have been identified as having perennial characteristics. These stream segments are in Stands 2-30, 2-45, 2-59, and 2-34d. Rationales regarding the effectiveness of these standards and guidelines are in the project file.

Scenery Management

6. A four-acre reserve area will be retained in Stand 2-34b to minimize visual impact from Devil's Slide (a viewpoint accessed by a hiking trail just northwest of Stark Village). Scenery modeling showing the effectiveness of this approach is in the project file.

Soils

7. The following soil conservation practices are emphasized for this project (USDA Forest Service, 2005a, Soil and Water Conservation Practices, S-1, p 2-30):
   - To limit the area subject to soil compaction, new log landings will be the minimum size necessary to meet the requirements of the equipment, the quantity and type of forest products, and safety.
   - Harvested whole trees may be skidded to landings and the tops and limbs will be scattered on landings, skid trails and within stands to retain soil nutrients and to reduce compaction and erosion during and after operations as needed.

The rationale for the effectiveness of soil and water conservation measures is in the project file.

Wildlife/Threatened and Endangered Species

A design feature to protect goshawk nesting sites is integrated into the proposed alternatives.

8. To maintain habitat value, protect springs and vernal pools in Stand 2-24, a vernal pool in Stand 2-35a, a large spring at the base of the slope in the northern portion of Stand 2-34d and a spring at the base of the slope in the center of Stand 2-59 and in the middle of Stand 4-34, as well as springs or vernal pools in Stands 2-16, 2-19, 2-30, 2-35b, 2-45, 2-63, 3-16a, and 4-15 (USDA Forest Service 2005a, Wildlife, G-11, p 2-34).
9. Reserve hemlock inclusions in Stand 2-10 and large white pine and large hemlock in Stand 2-24 for wildlife trees (these have been used as bear security trees). Exceptions may include hazardous trees and trees located where parts of skid trails or landings that cannot be moved because of land features (USDA Forest Service, 2005a, Wildlife, G-3, p 2-33).
10. To maintain hard mast component as a food source for wildlife, beech trees with abundant bear claw marks should not be marked for cutting unless the tree is expected to die in the near future. Bear-clawed beech was observed in Stands 2-35a, 2-45, and 4-34. Exceptions may include hazardous trees, trees located where parts of skid trails or landings that cannot be moved because of land features, and trees with >75% crown damage since there is a high probability they will die in the near future. In areas with heavy concentration of bear trees, patches of habitat will be reserved to minimize damage to the trees (USDA Forest Service, 2005a, Wildlife, G-3, p 2-33).
11. Stumping and mowing (if used for maintenance) of the permanent wildlife openings (Stands 3-13a and 2-29a) will occur during late summer or fall (outside nesting season) when ground conditions are operable for heavy equipment (dry and snow-free) (USDA Forest Service, 2005a, Wildlife, G-11, p 2-34).
12. Maintain a buffer of mature trees along Mill Brook Road to screen expanded permanent wildlife opening (Stand 2-29a) from the road to discourage camping (USDA Forest Service, 2005a. Wildlife Openings G-1, p 2-35).
13. Where possible, do not cut hemlock as a tree source for watershed improvement projects since hemlock is a minor species in the area (USDA Forest Service, 2005a, Wildlife, G-3, p 2-33).
14. Maintain a 300-foot no-harvest buffer around the goshawk core nesting area (four nests) to maintain habitat character. An existing skid trail in the buffer zone may

be used to skid timber to the landing because this activity would occur when the goshawks are not nesting. Cease all harvesting operations in adjacent Stands 2-24, 2-34b, and 2-34e and skidding in the buffer zone to protect nesting goshawks from March 1 through August 15 (USDA Forest Service, 2005a, Wildlife Habitat Management, S-3, p 2-33; USDA Forest Service 2005b; C. Costello per. comm. 2007; NH and SPNHF 1997, page 74; Flatebo et al. 1999, p. 78).

Chapter 3: Affected Environment and Environmental Consequences

3.0 Introduction

This chapter addresses the site-specific effects of the proposed activities on the resources in the Mill Brook project area. Field work, monitoring data, published science, and public input played a key role in this analysis. It is important to note that findings regarding potential effects may change from project to project depending on the land features, project proposals, new science, and results of public scoping. Each resource section includes:

- A description of Affected Environment.
- The relevant elements of each resource and how effects on those elements are measured.
- Analysis of Direct and Indirect Effects on the Resource (By Alternative):
  - Direct Effects occur at the same place and time as the proposed activity.
  - Indirect Effects are later in time and/or farther removed in distance, but are still clearly a result of the proposed activity.
- Analysis of Cumulative Effects on the Resource (By Alternative):
  - 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.

The Final Environmental Impact Statement (FEIS) prepared for the Forest Plan is the programmatic-level analysis for all resource discussions in this chapter and serves as the foundation for all project-level analysis. The proposed activities in Alternatives 2 and 3 are typical management actions on the White Mountain National Forest, each falling within the range of actions anticipated and included in the conclusions reached in the FEIS (USDA Forest Service 2005b). This project-level analysis is tiered to the FEIS, and where it is appropriate to do so, the FEIS is incorporated by reference, with project information summarized here.

3.1 Past, Present, and Reasonably Foreseeable Future Actions

Cumulative effects analyses require consideration of past, present, and reasonably foreseeable future actions in the analysis area for each resource. The geographic area and the temporal scope for cumulative effects analyses are identified for each resource based on potential effects of this action in its site-specific context. The bounds are the same for some resources and different for others. In all cases, the rationale for the area and time period is noted in individual resource sections in this chapter. Activities and effects on private lands are considered when they are within the spatial and temporal cumulative effects analysis area.

Below are descriptions of actions considered in cumulative effects analyses in various geographic areas associated with the Mill Brook project:

Mill Brook Habitat Management Unit (HMU)

See Map 7 — Cumulative Effects Area for Vegetation and Wildlife

Past Projects (10 years): Forestry activities occurred on three separate projects (West Branch, Little Mac, and McCordick Brook) in this Habitat Management Unit in the last 10 years. These treatments occurred on 356 acres or 2% of the area. They included 233 acres using uneven-aged management such as group selection and individual tree selection, and 123 acres using even-aged management such as patch cut, clearcut and seed tree cut. There are about 1,471 acres of private inholdings in this HMU: approximately 250 acres were characterized by the State as "heavily cleared" in 2006 (Sundquist 2007 Personal Communication).

Other projects in this HMU **in the last ten years** include ongoing maintenance of one permanent wildlife opening, backcountry campsite and trail maintenance, and construction of tent platforms to address resource concerns at Unknown Pond. Other past projects in this HMU are discussed in other resource sections because they occurred beyond the ten-year timeframe.

Present or Ongoing Projects: Alternatives analyzed in this EA.

Reasonably Foreseeable Future Projects (10 years): Management activities in the next ten years include ongoing maintenance of permanent wildlife openings through prescribed fire or mechanical methods and ongoing maintenance of trails and back-country campsites. No national forest timber sales after the Mill Brook project are planned in the next ten years. Personal communication with the private land manager indicates that there are about 80 acres of private inholdings in this HMU that could be harvested with a shelterwood treatment in the next 10 years.

South Pond HMU

See Map 7 — Cumulative Effects Area for Vegetation and Wildlife

Past Projects (10 years): Forestry activities occurred on four separate projects (Fogg Brook, Higgins Brook, War Camp, and Rocky Pond) in this Habitat Management Unit in the last 10 years. These treatments occurred on 1,133 acres or 7% of the area. They included 977 acres of uneven-aged or intermediate harvest treatments and 156 acres of even-aged harvest.

Other projects in this HMU **in the last ten years** include ongoing maintenance of permanent wildlife openings using prescribed fire or mechanical methods, establishment of the Rocky Pond snowmobile trail, closing the Pearly Lang snowmobile trail, reconstruction of bridges and roads along the South Pond and York Pond Roads, trail maintenance, and maintenance of backcountry and developed recreation facilities. Other past projects in this HMU are discussed in other resource sections because they occurred beyond the ten-year timeframe.

Present/Reasonably Foreseeable Future Projects (10 years): Timber harvests approved in the 2007 North Kilkenny environmental assessment will commence in fall of 2008, harvesting about 1,007 acres including 99 acres of even-aged harvest, 859 using uneven-aged or intermediate harvests, and expansion of three permanent wildlife openings for a total of 25 acres. Approximately 0.7 miles of road will be constructed and/or reconstructed for this project. A watershed improvement project will add wood to 0.6 miles of an unnamed perennial stream and will stabilize 0.8 miles of old skid roads. It is expected that the Forest Service will assess the southern portion of the South

Pond HMU to determine potential for vegetation management activities in the next ten years. Such activities would take place on MA 2.1 lands, and would be consistent with the same vegetation and wildlife habitat objectives that defined the Need for Change for this project.

There are about 120 acres of private inholdings in this HMU, managed primarily for timber production. Contact with the landowners indicate a possible shelterwood harvest in the next 10 years.

Mill Brook Watershed

See Map 4 — Cumulative Effects Area for Air, Fish and Aquatic Resources, Soils, and Water

Past Projects (15 years): Hickey Brook (63 acres in 1992) and West Branch Timber Sales (86 acres in 2000), and approximately 250 acres of private land heavily cleared.

Present Projects: Alternatives analyzed in this EA.

Reasonably Foreseeable Future Projects (10 years): Management activities that will occur in this watershed in the next ten years include ongoing maintenance of permanent wildlife openings through prescribed fire or mechanical methods and ongoing maintenance of trails and backcountry campsites. No national forest timber sales beyond the Mill Brook project are planned in the next ten years in this watershed.

There are about 940 acres of private inholdings in this watershed, managed primarily for timber production. Complete harvesting records regarding timing and type of harvests on private lands is not available.

Pond Brook Watershed

See Map 4 — Cumulative Effects Area for Air Quality, Fish and Aquatic Resources, Soils, and Water

Past Projects (15 years): Periodic maintenance on Devil's Hopyard Trail, Kilkenny Ridge Trail, and South Pond recreation area.

Present Projects: Alternatives analyzed in this EA.

Reasonably Foreseeable Future Projects (10 years): About 240 acres in the Pond Brook watershed will be harvested beginning in 2008, as approved in the North Kilkenny environmental analysis. Soil disturbance from roads, landings and skid trails will total about 36 acres in this area.

There are about 120 acres of private inholdings in this watershed, managed primarily for timber production. Contact with the landowners indicate a possible shelterwood harvest in the next 10 years.

Eligible Wild and Scenic River Corridor

See Map 6 — Cumulative Effects Area for Recreation, Scenic Viewpoints, and Wild and Scenic Rivers

Past Projects (18 years): West Branch Timber sale (86 acres in 2000), and 200 acres harvested on private land in recent years.

Present Projects: Alternatives analyzed in this EA.

Reasonably Foreseeable Future Projects (12 years): Possible 80 acres of shelterwood on private land.

Kilkenny Inventoried Roadless Area

See Map 5 — Cumulative Effects Area for Inventoried Roadless Areas

Past Projects (10 years): Portions of eight timber sales (Keenan Brook, Lower Loop, Pond Hill, Round Mountain, Fogg Brook, West Branch, Little Mac, McCordick Brook) totaling 346 acres of timber harvest since 1998.

Present Projects: 313 acres (292 within the IRA) of timber harvest and 5 acres of wildlife opening maintenance analyzed in Alternative 2 of this EA.

Reasonably Foreseeable Future Projects (20 years): It is expected that the Forest Service will assess the southern portion of the South Pond HMU (which includes a portion of the Kilkenny IRA) to determine potential for accomplishing Forest Plan resource objectives in the next ten years.

Adjacent Private Lands

See Map 7 — Cumulative Effects Area for Vegetation and Wildlife

Several scoping respondents commented about harvesting done in recent years on private lands in and near the project area. Resource specialists contacted various organizations and compiled the most recent timber harvest data available (2007). The information was gathered from landowners, town records, Dartmouth College, and the Society for the Protection of New Hampshire Forest. This analysis is based on the best available information. To the best of our knowledge, no source of information has been ignored or overlooked. We are not aware of any information regarding past harvest dates, types of harvest, and future harvest plans that we did not consider. Cumulative effects analyses for timber and wildlife resources considered the following data:

The Town of Northumberland encompasses 23,641 acres, with 789 acres in national forest ownership (3.3%). The Town of Stark encompasses 37,760 acres with 19,163 acres in national forest ownership (51%). Approximately 23,000 acres in the Town of Northumberland and 18,000 acres of the Town of Stark lie adjacent to the HMUs, outside of the national forest boundary (Map 7). A total of about 2,111 acres (5%) were reported as "heavily cleared" in these two towns since 1996. Harvest data on private land does not include less intensive harvesting that has occurred in Stark and Northumberland in the past ten years. Timber harvest in the area is expected in the next ten years but the type, level, and location is unknown.

3.2 Air Quality

The following analysis summarizes the information contained in the Air Resources Report, completed by the air quality specialist for the White Mountain National Forest. The Report is located in the project file along with all supporting documentation and data used in this analysis such as research materials, the air quality model, and site-specific information as described in this section.

Affected Environment

The proposed Mill Brook project is influenced by several different air masses which pass over the White Mountains (Keim 2004). The project area is located predominately in the north-south trending valley of the Mill Brook watershed. A small portion of the project area is also located in the east-west trending valley of the Pond Brook watershed. Regional winds move from west to east, and local winds are dominated by mountain valley dynamics interacting with large-scale atmospheric movements (Keim 2004).

The project area is about 23 miles away from the Great Gulf Wilderness Area, the nearest Class I air quality area.

The Environmental Protection Agency (EPA) has set National Ambient Air Quality Standards (NAAQS) for six major pollutants called 'criteria' pollutants. They are ozone, carbon monoxide, nitrogen dioxide, particulate matter, sulfur dioxide, and lead. Areas of the country where air pollution levels persistently exceed the national ambient air quality standards may be designated "nonattainment" (USEPA 2007). The project area is not located in a nonattainment area for any of the NAAQS. Merrimack County, located 65 miles away from the project area, is the closest nonattainment area to the project due to high levels of ozone. Ozone reaches the White Mountains from large urban centers to the south, migrating north during times of high temperature and high levels of solar radiation. Ozone levels are expected to decrease as the New England states comply with lower 8-hour ozone standards beginning in 2009 (AIRMAP 2008).

Ambient levels of air pollution in the project area are mostly related to regional and industrial sources. The New Hampshire Department of Environmental Services has reported that there are no stationary sources of air pollution within the cumulative effects analysis area (NHDES 2006). Local sources include vehicle emissions, roads dust, and fire. Fire contributes particulates and carbon monoxide. Wildland fire is rare and most prescribed fires in the White Mountain National Forest are smaller than five acres. Except for larger wildland fires and short periods during prescribed fires, these sources generally do not result in air quality exceedences. Vehicle emissions are associated with carbon monoxide, hydrocarbons, nitrogen dioxide, and lead. Sunlight causes some of these pollutants to combine, forming ozone. Ground-level ozone data from south of Gorham, NH rarely exceeds air quality standards and is due mostly to summer weather and air flow, although it is not frequent enough to reach nonattainment status (Murray 2006).

Acid Deposition

Although the Mill Brook project would not contribute to acid deposition, distant industry and coal burning plants as well as those located in New England affect air quality over the White Mountain National Forest. Oxides of sulfur and nitrogen result

in acid deposition, which acidifies ponds and streams where buffering capacity is low (Driscoll et al 2001).

Measuring Effects to Air Quality

The criteria pollutants that have the potential to be affected by the proposed activities for this project are the particulates in the air produced by smoke and dust. Effects are measured using National Ambient Air Quality Standards (NAAQS): adverse effects result if the standards are exceeded by the proposed activities. Particulates are measured in lbs/acre and μg/m3 (microgram per cubic meter of air).

The Mill Brook proposals that could have a measurable effect on particulate standards are smoke from prescribed fire and dust from vehicle and equipment operations required for harvest, road and landing work, and watershed restoration. Road classification or decommissioning would not create particulates since these activities involve short term and limited or no surface disturbance.

Direct and Indirect Effects

The best available science was used to assess the potential direct and indirect effects to air quality related to the Mill Brook project. This includes the use of an air quality model, current research, and site-specific information as described in this section. The project airshed includes the air over the Mill Brook watershed and the Pond Brook watershed. An airshed is a part of the atmosphere that behaves in a consistent way with respect to the dispersion of emissions, such as the particulates produced by the proposed activities. 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, because air pollution entering the larger air mass is diluted. The ridges in this airshed form a boundary to local air pollution effects by blocking movement of pollutants and keeping the pollutants within the valleys. The temporal scope is during and several hours after prescribed fire and equipment use as smoke and dust dissipate into the environment.

Alternative 1

No activities are proposed and so no additional emissions would occur in project area. Forest Service classified roads will continue to receive their scheduled level of maintenance. Vehicle use will 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.

Alternatives 2 and 3

The potential for prescribed fire in Stands 3-13a and 2-29a would result in emissions of particulates and other pollutants to the air. The major pollutant of concern in smoke from fire is fine particulate matter, both PM10 (particulate matter less than 10 microns in diameter) and PM2.5 (particulate matter less than 2.5 microns in diameter) (USDA Forest Service 2002). Carbon monoxide (CO) concentrations also increase from smoke emissions (USEPA 2001).

The Forest First Order Fire Effects model was used to predict smoke emissions for the proposed prescribed fire (FOFEM models results 2007, and Reinhardt 2003).

This program considers the proposed burn's region (Northeast), vegetation type, and season. For Alternative 2, the model predicted a total of 2,715 lbs/acre of carbon monoxide, 210 lbs/acre of PM2.5, and 249 lbs/acre of PM10 would be emitted by the 11 acres of proposed burning. Prescribed fires are not considered a significant cause of nonattainment of NAAQS (USDA Forest Service 2002), and it is unlikely that burning the proposed 11 acres would cause nonattainment status since nonattainment status results from ongoing continued exceedences of air quality standards. Since only 5 acres are proposed for burning in Alternative 3, expected effects would be even smaller.

Potential health effects would be limited due to the small amount of proposed prescribed fire and by using practices designed to protect public health. Public notification of the proposed prescribed burn would be given prior to the start of prescribed burns. In addition, increases in emissions would be short-term and localized due to the small size and limited duration of the proposed prescribed fire. FOFEM estimates the total duration of flaming and smoldering of the fire to be 1 hour and 23 minutes. These results are for the entire proposed 11 acres, which will probably not be burned at the same time resulting in even lower levels of emissions. FOFEM modeled PM2.5 concentrations .1 mile downwind from the burn units to be about 16 μg/m3. This is less than the 35μg/m3 standard for PM2.5. There are no residences within .1 mile of the proposed burn units so no residences would be effects by these levels.

Vehicle traffic on the Mill Brook Road would increased during project implementation, which has the potential to increase dust in the air, however with mostly fall and winter harvesting, dust will be minimal. The Forest Service would require dust abatement treatments during timber haul if needed.

An additional effect to air quality is the use of heavy equipment and gas-operated tools during timber harvest and road maintenance operations. Ground level ozone is worst during summer months (Murray 2006), so fall or winter harvest would minimize this effect, making it unlikely for ozone to form at elevated levels because of the proposed activities. At least 95% of the stand acreage would be harvested in the fall or winter. 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

The cumulative effects area for air quality is the same as for direct and indirect effects and is chosen because at this scale the effects of multiple uses in the airshed could result in cumulative effects. The timeframe analyzed is from 1998-2018 and 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. As with direct and indirect effects, the best available science was used to assess the potential effects to air quality related to the Mill Brook project.

Alternative 1

No local emissions related to the proposed action would occur. The existing condition and trends as described in the affected environment would remain much the same. The same activities that currently are occurring would continue to occur. Future vehicle emissions are likely to increase as more visitors come to the White Mountain National Forest. This would contribute to ground level ozone when conditions are suitable.

Cumulative effects from regional, industrial, and local sources would continue to occur with the same trends as described in the Forest Plan FEIS (USDA Forest Service 2005b).

Alternatives 2 and 3

The proposed prescribed fire in Stands 2-29a and 3-13a could be used more than once in order to maintain them as wildlife openings. As discussed above, the project is not located in a nonattainment area. Prescribed fire most often occurs in the spring or fall, when ozone is not a concern (Murray 2006). Since fires are not common or widespread in the analysis area and little prescribed fire use is anticipated in the foreseeable future, it is unlikely that prescribed fires would result in cumulative effects since they tend to be isolated events. This includes the use of prescribed fire on private lands within the cumulative effects area.

Alternatives 2 and 3 would have the same emission-producing activities as described in the Direct/Indirect Effects section, however no adverse cumulative effects are expected because the area meets air quality standards and these emissions will be of limited duration. Effects of activities both on and off Forest Service lands are not expected to cause NAAQS to be exceeded within the timeframe analyzed.

3.3 Fish and Aquatic Habitat

The following analysis summarizes the information contained in the "Mill Brook Vegetation Management Project Specialist Report for Fish and Aquatic Habitats," completed by the Forest Fisheries Biologist. The Report is located in the project file along with all supporting documentation and data used in this analysis such as research materials, monitoring results, and site-specific information as described in this section.

Affected Environment

There are approximately 16.5 miles of mapped perennial streams in the Mill Brook watershed. These are all fish-bearing streams. There is an additional 9.3 miles of tributaries to Mill Brook which are mapped as intermittent streams. Intermittent streams may or may not provide fish habitat. These stream channels drain land from approximately 0.5 to 1.1 square miles from their mapped origin to their mouths at Mill Brook. Some portion of these drainages may actually be perennial but the distance is unknown and may actually change from year to year. Two of these streams, flowing from the east into Mill Brook, were examined in the summer of 2007 and appear to have perennial characteristics in the lower reaches. Wild brook trout were observed in the most northern brook, noted as Pucci Brook, both below and above the Mill Brook Road crossing of the stream. Further upstream of the FR11E crossing, this brook braids into multiple channels and becomes marginal fish habitat at best. The other tributary, now noted as Peps Brook, further south, may have warmer water than other tributaries because it drains a wetland complex just east of the Mill Brook Road. Drainages into this wetland are also marginal fish habitat at best.

Overall, there are steep gradients and high stream velocities in the watershed.

Data Collection: Stream Temperature, Fish Inventory, and Stream Invertebrates

Data and supporting information for the following sampling summaries are detailed in the "Mill Brook Vegetation Management Project Specialist Report for Fish and Aquatic Habitats" in the project file.

Stream temperature: Based on mean July water temperature (MJWT) measured in 2006, it is reasonable to conclude that Mill Brook and its tributaries are coldwater streams. Water temperature sampling shows that all reaches tested (two headwater sites, one middle, and one lower reach) are well below the temperature threshold of 66°F that would alter the species composition of the fish community (Wehrly et. al. 1999).

Fish inventory: Fish sampling at the four temperature sampling sites revealed a mixed population of wild and non-native trout (brook, brown, and rainbow), slimy sculpin, and longnose dace. All trout at the headwater sites and the middle reach appeared to be wild, in contrast with the lower reach where the majority of fish biomass consisted of hatchery brook trout.

Based on New Hampshire's wild brook trout stream productivity classification (Sprankle 2000), the fish data collected in Mill Brook indicate that the lower and middle reaches have low productivity, while the headwater reaches have high productivity. The trends in the Mill Brook watershed are similar to other waters in the White Mountains, with the exception of the large wild brown trout population. Typically,

first and second order mapped perennial streams in the White Mountains produce higher densities of wild brook trout than the 3rd and 4th order streams, which is true in Mill Brook. However, Upper and West Mill Brook estimates are some of the highest found to date in the White Mountains.

Stream invertebrates: Sampling was done by the University of New Hampshire at three of the four sampling sites in the Mill Brook watershed (Chandler 2006) and three other watersheds in the White Mountain National Forest. Comparison of Mill Brook results to those from Wonalancet Brook, a reference site without a modern history of land use disturbance, show similar ranges in species diversity and average pH levels of just below neutral.

Aquatic Habitat Studies

Data and details of studies mentioned below are in the project file.

The biggest threats to New Hampshire coldwater streams that provide habitat to wild Eastern brook trout are loss of riparian shade and instream cover from urban development; sedimentation and fragmentation from roads; non-native trout species; acid deposition; and dam inundation/fragmentation (Eastern Brook Trout Joint Venture 2006).

A primary concern regarding land management in the Mill Brook watershed is to maintain the integrity of coldwater habitat for fish and other aquatic species. State and Federal laws, Best Management Practices, project design features, and Forest Plan standards and guidelines are designed to protect streams by preventing activities that could cause excessive increases in stream temperatures or sedimentation. Protective requirements also promote the long-term free movement of fish populations as well as the potential for recruitment of woody material that can improve hydrologic function and instream habitat conditions.

Stream Temperature

While studies in the White Mountains have shown that timber harvest can increase summer time stream temperatures and widen diurnal stream temperatures (Burton and Likens 1973), these effects can be mitigated by maintaining buffers in headwater streams (Wilkerson et. al. 2006). The best available science regarding stream buffers suggests that implementation of Forest Plan guidelines for riparian and aquatic habitats would prevent significant changes in summertime stream temperatures and therefore maintain the integrity of coldwater streams.

Sedimentation and Fragmentation

Hakala (2000) found that fine sediment, of sizes generally documented from logging roads, can negatively impact the abundance of newborn brook trout, however sedimentation did not reach threshold levels in spawning sites in steeper gradients or where high stream flows are encountered, which is the case in Mill Brook. Marschall and Crowder (1999) modeled the population responses of various anthropogenic effects on brook trout populations and determined that while severe sedimentation could have potentially strong negative effects from an extreme increase in the egg to larva mortality. This effect was not likely to result in local extinction. This would indicate that either local brook trout populations can recover from severe sedimentation that is not chronic, or stream connectivity in the watershed allows for the free movement of brook trout individuals from less impacted areas. Given that forest

management activities on the WMNF are spread over time in a drainage area, and that protective measures are required, chronic sedimentation is uncommon. The effects of sedimentation on the long-term presence of wild brook trout populations in the White Mountains is expected to be minimal, as these effects are generally of short duration and very localized.

The culvert on FR 11 at Pucci Brook is the only man-made barrier to fish passage in the Mill Brook drainage.

Acid Deposition

Studies have shown that episodic acidification can have detrimental effects to aquatic life in mountain streams of the northeastern United States (Baker et.al, 1996; Baldigo and Lawrence, 2000; Baldigo and Lawrence, 2007). Studies in France found drastic reduction in stream invertebrate species diversity with decreasing pH from samples from 41 headwater streams where acidification of streams has been documented (Guerold et.al. 2000).

While research has shown the effects of both acid deposition and clean air regulations on soil and surface water chemistry in the White Mountains (Likens et.al. 1996), effects to aquatic biota have not been demonstrated as in the Adirondack and Catskill Mountains of New York and in Europe. Stream chemistry in New England surface waters has improved more than that in New York streams, attributed to the historically lower loading of acid deposition in most of New England (Driscoll et.al. 2001).

Measuring Effects to Fish and Aquatic Habitats

The relevant fish and aquatic habitats element for the Mill Brook project is water quality as measured by summer stream temperature, water chemistry, and sedimentation.

Effects on summer stream temperatures and water chemistry are based on the thoroughness of applying Forest Plan standards and guidelines, project design features, and NH Best Management Practices for the protection of coldwater fisheries.

The Mill Brook proposals that could have a measurable effect on summer stream temperature, water chemistry, and sedimentation are timber harvest, road and landing work, skid trails, and watershed restoration. Road classification or decommissioning would have no measurable effects on fish and aquatic habitats. No wildlife openings are in close proximity to streams; therefore, there are no measurable effects on summer stream temperature, water chemistry, and sedimentation from wildlife opening maintenance.

The Mill Brook Fish and Aquatic Habitat Report in the project file includes summaries of the FEIS analysis, relevant research regarding fisheries, and data and supporting documentation for the following effects analyses. This analysis is based on the best available scientific information concerning fish and aquatic habitat, and is grounded in field studies and surveys completed in the project area.

Direct and Indirect Effects

The Analysis Area for direct and indirect effects on fish and aquatic habitats is the entire Mill Brook watershed and also the drainage areas of Devil's Hopyard Brook and Cold Stream in the larger Pond Brook watershed because this is a connected network of streams in which aquatic organisms live and could be affected by the proposed actions.

The temporal scope for direct and indirect effects on fish and aquatic habitats is ten years in the past and ten years in the future. This temporal scope is identical to that described in the Water Resources section because changes in water quantity and water quality would lead to changes in aquatic habitats. This also allows the re-establishment of forest canopy that would have been opened up by timber harvest.

Alternative 1

In the absence of activities such as timber harvest, no increase in surface soil erosion, or reduction in forest canopy and tree density is expected because there is no road construction or reconstruction, or re-established use of existing skid trails and landings. The possibility of indirect effects to stream habitat or fish populations in this alternative would be limited to a flood washing out the Old Road because no watershed improvement action would have taken place. Fine sediments from a washout of this road would most likely deposit downstream of NH Route 110 where the gradient of Mill Brook flattens out. This could degrade fish habitat locally and increase bank erosion in lower Mill Brook. See the Water Resources section of this document for analysis of indirect effects of sedimentation.

Alternative 3

Alternative 3 proposes timber harvest in ten stands. Of those, Stands 2-30, 2-45, 2-59, and 2-34d contain portions of Pucci Brook and Peps Brook. Field visits (field notes in project file) indicated that the lower portions of these drainages could be perennial, so basal area removal restrictions were applied to the stand prescriptions along these streams. No clearcutting is proposed for these stands. Group selection and individual tree selection within 50 feet of the streams would leave a well-distributed stand of trees.

The direct effects of timber harvesting in this alternative would be potential sedimentation from road restoration maintenance, skid roads, and reduction in basal area, which varies depending on silvicultural treatment. The magnitude of soil erosion and direct effects from this disturbance are discussed in the Soils section. The indirect effects of erosion could be stream sedimentation that affects aquatic life. The potential for movement into streams is minimized by the implementation of Best Management Practices and Forest Plan standards and guidelines. While some sedimentation is likely in this alternative, research shows that fine sediment loading in high gradient streams has little effect on the production of young wild brook trout because it usually is flushed out of the stream during high flows (Hakala 2000). Given the steep gradients and high velocities of streams in the watershed, reduced trout egg to larva mortality from sedimentation is not believed to be a major factor influencing stream productivity. Even if some localized loss of brook trout eggs or young occurred in the project area, the low number of fish barriers in the watershed would allow brook trout to re-populate impacted streams from other un-impacted areas in the stream or from the larger watershed. All new stream crossings used in this project will be of a temporary nature, therefore, no new long-term fish barriers would occur.

There will be no indirect effects to fish habitat from changes in water quantity. The Water Resources section discusses in detail the effects of vegetation removal on water flow in the watershed.

Loss of riparian forest canopy would be minimal and short-term. Forest Plan standards and guidelines, Best Management Practices, and project design features all minimize any effect of forest canopy removal on stream temperatures (Wilkerson et al 2006).

Since no clearcuts would occur along perennial stream channels, there would be no measurable increases in summer time stream temperatures. Given the very cold water temperatures in the Mill Brook watershed, it would take very intensive clear-cutting in any one drainage area to affect the species diversity of the aquatic life in that drainage area. Clear-cutting intensity will be very low in this alternative.

While stream pH can strongly influence stream productivity and diversity of aquatic life, as indicated by research on wild brook trout populations, the indirect effect on stream chemistry from vegetation removal in the project area is not expected to alter water quality to thresholds that can affect aquatic life. Low flow pH measurements taken during invertebrate sampling in Mill Brook are comparable to those taken from reference streams in the Catskills which are thought to have more stable acid-base chemistry (Baker et.al. 1996). Trout biomass estimates in the upper tributaries of Mill Brook are also comparable to those measured in the low chemical severity class streams of the Catskills, suggesting that episodic acidification has not caused local extinctions in the watershed. If this alternative were selected, removal of vegetation would not exceed the 17% in any first order watershed. Removal of 14% of the basal area in an acid sensitive drainage of the Catskills had no effect on brook trout survival, so it would seem unlikely that slightly higher tree removals in a much lower acid sensitive watershed would cause different effects.

Watershed improvement projects would have little direct effect on aquatic life. Allowing high flows to access side channels and promote storage of sediments in these channels promotes better local hydrologic function, but positive effects to aquatic life would be very localized and immeasurable. While improved nursery habitat for fish may be created in the side channels, larger limiting factors of fish production in the main channel of Mill Brook would still be in control. The proposed watershed restoration project on the Old Road would reduce the chance of a washout and resulting sedimentation into Mill Brook.

Alternative 2

Since all of the activities proposed in Alternative 3 would also occur in Alternative 2, the effects discussed in Alternative 3 would also apply to Alternative 2. Eleven additional stands would be harvested in this alternative, but only portions of two stands may lie in riparian areas of perennial streams.

Stands 2-12 and 3-31 are adjacent to Hickey Brook. Stand 2-12 is also adjacent to Mill Brook. Application of Forest Plan guidelines would leave a minimum 25′ no-cut zone along these brooks in each of these stands. The no-cut zone would ensure future recruitment of large wood into these brooks. Neither treatment would be an even-aged management prescription so removal of some trees in the riparian area would not alter stream temperatures as research has shown (Wilkerson et al. 2006). A temporary bridge crossing of Hickey Brook would be installed to access stands north of the brook, but it would not create a fish barrier because it is not affecting the stream channel in any way. Some minor sedimentation may occur into Hickey Brook, but would not have a measurable effect for the same reasons already discussed in Alternative 3.

Even though this Alternative harvests more acres of forest, most occurring west of the main stem of Mill Brook, little difference in effects on fish and aquatic life is expected in this alternative as compared to Alternative 3.

Cumulative Effects

See Map 4 and Section 3.1 for location and projects considered in the following cumulative effects analysis.

The Analysis Area for cumulative effects on fish and aquatic habitats is the entire Mill Brook watershed and the drainage areas of Devils Hopyard Brook and Cold Stream in the larger Pond Brook watershed. This is a connected network of streams in which aquatic organisms live and could be affected by the proposed actions.

The temporal scope for cumulative effects on fish and aquatic habitats is ten years in the past and ten years in the future (1998 to 2018). This temporal scope is identical to that described in the Water Resources section because changes in water quantity and water quality would lead to changes in aquatic habitats. This also allows the re-establishment of forest canopy that would have been opened up by timber harvest.

Alternative 1

Past and future timber harvesting between 1998 and 2018 would not likely have any measurable effect on fish, other aquatic life, or aquatic habitat because Forest Plan standards and guidelines have been applied in the past and will continue to be applied in the future. Effects from this alternative would be due to floods, droughts, and windstorms. The may have been some effects to aquatic habitats within the East Branch of Mill Brook after timber harvest occurred on private lands in recent years. Floods may have some localized effect to habitats in the lowest reach of Mill Brook if the Old Road were to wash out and dump substantial volumes of new sediment into the main channel.

Alternatives 2 and 3

The proposed timber harvest is not expected to have any measurable effect on aquatic life or habitats as discussed for direct and indirect effects because Forest Plan standards and guidelines have been applied in the past and will continue to be applied in the future. Harvest since 1998 also had little effect and any future harvest is expected to occur under guidelines and protections that minimize any impact to stream habitats. Timber harvest has occurred within the private land block in the middle of the Mill Brook watershed during the last few years. Any effects to water quality would have occurred primarily within the East Branch of Mill Brook. This project would treat an additional nine acres, or less than 1%, of the East Branch of Mill Brook. If water quality effects did occur within the East Branch due to harvest on private land, the small additional harvest from this project would still not produce any additional measurable effects. Cumulative effects of these alternatives on aquatic life and habitats are expected to be indiscernible. Effects would again be mainly due to natural events such as floods, droughts, and windstorms.

3.4 Heritage Resources

The following analysis summarizes the information contained in the project file such as scientific papers, consultation correspondence, the Cultural Resources Reconnaissance Report, site-specific information, and other supporting documentation and data.

Affected Environment

A Cultural Resource Reconnaissance Report (CRRR # 06-2-3 in the project file) was completed covering the project area. Five new historic sites were documented. These sites and those previously located will be avoided during project activities.

There are no known heritage resource sites in the project area that are eligible or are being evaluated for the National Register of Historic Places, nor were any pre-historic cultural resource sites identified.

The Stark Union Church is on the National Register of Historic Places, listed in 1983. It sits on the north side of NH Route 110 upon entering Stark Village, less than a mile west of the Route 110 and Mill Brook Road junction, and less than a mile from the proposed watershed restoration project near the Old Road. Along with an adjacent covered bridge, it provides a picturesque image of rural New England.

Scoping of recognized Native American Tribes in Maine and local Native American individuals has revealed no concerns that any special areas would be disturbed by the proposed timber harvest. A Forest Service search of records and local histories has not indicated any unusual activities or Native American camp locations.

Measuring Effects to Heritage Resources

The relevant heritage resources elements for the Mill Brook project are pre-historic and historic artifacts and sites, known and unknown.

Effects to heritage resources can come from (1) potential removal or vandalism to existing sites from increased human activity in the project area, (2) ground-disturbing activities that may impact undiscovered artifacts, and (3) potential structural effects to the church from log truck traffic passing by the Union Church.

The Mill Brook proposals that could have a measurable effect on heritage resources are: timber harvest, landing construction, skid trails, log truck traffic, wildlife opening maintenance, and watershed restoration. Road restoration maintenance/classification/decommissioning would have no measurable effects on heritage resources.

Direct, Indirect, and Cumulative Effects

The Analysis Area for direct, indirect and cumulative effects to heritage resources encompasses the areas in Compartments 2, 3, and 4 in the Mill Brook HMU where project activities would occur, and Route 110 in Stark in the area of the Union Church. This area was chosen because any effects would be to the individual resources in the project area. The temporal scope for direct, indirect and cumulative effects on heritage resources is ten years past and ten years into the future from when proposed actions would occur (1998-2018). This is to take into account the last ground-disturbing activities that occurred in these compartments: West Branch (2000), Little Mac (2002) and McCordick Brook (2004) Timber Sales. A look ten years into the future will consider any planned ground-disturbing activities.

Alternative 1

This alternative would not have any effects on heritage resources. There would be no change to the human activity on the area, no effect on known artifacts, and no ground-disturbing activities to affect undiscovered artifacts. There would be no Mill Brook log truck traffic on NH Route 110.

Alternatives 2 and 3

There are possible indirect effects to undiscovered artifacts when equipment is operating on bare ground during summer and fall harvest. These could include destruction of artifacts and degradation of human-made alterations such as former logging campsites. Alternative 3 proposes fewer acres of bare-ground harvest, therefore less potential to affect undiscovered artifacts than Alternative 2. In addition, Forest Plan standards and guidelines will protect all known and discovered artifacts, and the timber sale contract provides protection to cultural resources through cancellation or modification of the contract if cultural resources are identified during harvest operations.

Although all logging truck traffic would use NH Route 110 as they depart the project area, the amount of logging truck traffic expected to pass by the church is unknown, as markets for timber products exist both to the east and west. For Alternative 2, an expected 470 tractor-trailer loads (3.5 MMBF of total volume/estimated 7,500 MBF per truckload) of timber products would be hauled over the 3-year life of the proposed harvest. For Alternative 3, an estimated 330 truck loads would be hauled. Even under Alternative 2, this equates to an average of about 160 trucks per year. The overall operating season is expected to be at least 6 months during the year, though it varies each year with road use restrictions. Hauling can occur seven days per week throughout the operating season. The shortest likely operating season (180 days) would equate to less than one trip per day over the life of the project, though there will be some days with no loads and others with several.

Existing traffic in the NH Route 110 area averages 1,800 vehicles though Stark Village each weekday, including 56 heavy trucks, as recorded by NH Department of Transportation traffic counters in July 2006 (Szczublewski personal communication 2007). An active rail line less than 500 feet north of the church makes two daily runs, transporting about 50,000 tons of freight (St. Lawrence & Atlantic Railroad Regional office, personal communication 2007). Log truck traffic from the Pond Brook and Upper Ammonoosuc timber sales will also haul on NH Route 110, although it is unknown in which direction they will haul.

One study by the Institute for Research Construction (Hunaidi 2000) found that road "vibration levels are rarely high enough to be the direct cause of (structural) damage" (pg. 4). The report states that several factors influence the vibrations from road traffic, including road condition, speed, vehicle suspension, soil conditions, and season. When soils are frozen, reduced vibration occurs. In Canada, studies indicate that vibration amounts when the ground is frozen are less than half those of non-frozen conditions (Hunaidi 2000 - Construction Technology Update #39). Route 110 is a paved road that receives regular maintenance, which should result in less vibration than a bumpy dirt or back road. The speed limit in near the church is 45 mph. For this project, operating season restrictions suggest that a substantial portion of the hauling is likely to occur in winter, which would further reduce the potential for impacts.

Research in England indicates that vibrations from vehicle traffic can be a nuisance to occupants of buildings and may cause cosmetic damage, such as cracking of plaster, but probably does not cause structural damage, even to historic buildings near high traffic roads (summarized in Hume 1995, Watts 1989, Watts 1990).

The abundance of existing heavy truck traffic and freight train runs without apparent damage to the church, and research on vibration impacts indicate it is unlikely that additional log truck traffic would damage the church, even if all the sales haul through Stark.

Heritage resource surveys conducted for the West Branch, Little Mac and McCordick Brook environmental assessments – earlier timber sales in the same geographic area -- showed that no heritage resources were found in or adjacent to the proposed Mill Brook harvest units. No other ground-disturbing activities are planned in these compartments over the next 10 years. Harvest activities will, for a time, change the forested environment and perhaps could draw hunters and thus bring additional people into the area of the heritage sites. Additional impacts to sites are not anticipated, but may occur due to increased visitation.

The standard cultural resource clause will be included in the timber sale contracts so that these sites will be avoided and any sites discovered during project activities will be protected until the Forest Archaeologist can evaluate them and develop any needed mitigation.

On August 29, 2006, the New Hampshire State Historic Preservation Officer (SHPO) concurred in writing with our site avoidance proposal and our No Effect finding for this project.

3.5 Inventoried Roadless Areas

The following analysis was completed by the Assistant Ranger for Recreation, and is supported by information such as research papers and data in the project file.

Background

As part of the revision of our Land and Resources Management Plan in 2005, the Forest conducted an inventory of roadless areas across the Forest. Identifying and evaluating inventoried roadless areas (IRAs) is a planning process rather than a formal management area designation. In essence, it is a tool designed to assist planners in making recommendations on how the land should be managed for the future.

To conduct the inventory and evaluation we first considered the characteristics of the land and whether or not areas met specific criteria from the Forest Service Handbook to be identified as an IRA. Once the inventory was complete, we were then able to evaluate additional characteristics of the land (again, according to specific criteria from the Handbook) in order to make recommendations whether some or all of the IRA should be designated by Congress as wilderness, or managed for other goals and objectives.

Our starting point was an inventory of lands previously identified through earlier evaluations: In the early 1970s the Forest Service conducted a examination of all National Forests as part of the Roadless Area Review and Evaluation (RARE I). This was revised in 1979 (RARE II), and the results were documented in a final environmental impact statement for that national process. In the late 1990s the agency was directed to analyze new management direction for inventoried roadless areas (those identified in RARE II and subsequent inventories, such as our 1986 Forest Plan) as part of the Roadless Area Conservation Rule (RACR). This rule was finalized in 2001, and did set specific management direction to limit road building and timber harvest on lands included in the inventory, except in special circumstances. The inventory for the Roadless Area Conservation Rule specifically included 241,000 acres on the White Mountain National Forest.

Recognizing that the White Mountain National Forest is a constantly-changing landscape and that in many locations previous human activities – including forestry and road construction – become less evident over time, a new inventory was conducted and presented to the public in our 2004 Draft EIS for Forest Plan revision. Through public involvement, further analysis, and extensive field verification, additional adjustments were made to the inventory for the Final EIS. This new 2005 inventory resulted in 27 inventoried roadless areas totaling 403,000 acres. (This was simply an inventory process, not an allocation or designation of land to a Management Area.) Following our planning handbook direction, each area was then evaluated for its capability, availability, and need as wilderness.

Ultimately, the Forest Service recommended to Congress in the 2005 Forest Plan that 34,500 acres be designated as wilderness in the Wild River valley and around the existing Sandwich Range Wilderness (USDA Forest Service 2005b, Appendix C). Congress followed these recommendations closely, enacting the New England Wilderness Act in December 2006, creating the 24,000-acre Wild River Wilderness and adding 10,800 acres to the Sandwich Range Wilderness, bringing the total Wilderness acreage on the White Mountain National Forest to 148,800 acres.

The remaining lands in the roadless area inventory were allocated under the Forest Plan and FEIS (USDA 2005a and 2005b) to other management areas, consistent with Forest Service Handbook direction (FSH 1909.12 Chapter 70). Most of the land in IRAs was allocated to management areas that emphasize semi-primitive conditions and recreation use; other lands were assigned to management areas that emphasize timber harvest and wildlife habitat creation. Allocations were made based on a wide variety of factors, all with the goal of providing a balanced mix of uses across the Forest (USDA 2005a and 2005b).

The management of IRAs has undergone a great deal of legal scrutiny over the years. The RACR and its associated management direction for IRAs was enjoined in a Federal District Court in 2003 before being replaced by the State Petition Rule, an entirely new regulation put into place in 2005. The State Petition Rule was also challenged, and a 2007 Federal District Court ruling struck it down and re-established the RACR of 2001. In 2008, a Federal District Court again ordered that the RACR be enjoined. All of these court decisions apply only to lands covered under the RACR. On lands that were included in the inventory conducted during Forest Plan revision but were not part of the RACR inventory, management must be consistent with Forest Plan direction for the particular management area into which those lands were allocated.

Analysis Method

Our analysis of effects to the Kilkenny Inventoried Roadless Area for the Mill Brook project is based on the inventory criteria and the wilderness capability criteria from the Forest Service Handbook; the same criteria used in Forest Plan revision.

We first considered whether the proposed activities would alter the degree to which lands included in the Kilkenny IRA would meet the inventory criteria from the FSH (1909.12 chapter 70, section 71) during and following project implementation. Table 3 shows the inventory criteria and the method used to measure project-level effects on each criterion.

Table 3: Inventory Criteria and Measurement Methods

Criteria Description		Method for Measuring Project-level Effects on the Criteria
1	The land is regaining a natural, untrammeled appearance.	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.	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.	Measured by total acres of national forest 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.	Measured by total acres of harvest and total miles of new road construction.

Criteria Description		Method for Measuring Project-level Effects on the Criteria
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.	Measured by total miles of existing improved road and total miles of proposed new road construction.
6	No more than 15 percent of the area is in non-native, planted vegetation.	Measured by total acres of non-native planted vegetation.
7	Twenty percent or less of the area has been harvested within the past ten years.	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.	Measured by total number of private dwellings.

After taking a hard look at whether lands within the IRA would continue to meet roadless inventory criteria during and after project implementation, the interdisciplinary team evaluated the degree to which possible wilderness characteristics of lands within the IRA would be affected by the proposed project. As stated earlier, for this part of the analysis the team used the wilderness capability evaluation criteria from Appendix C of the FEIS for the Forest Plan:

Table 4: Wilderness Evaluation Criteria (Capability) and Measurement Method

Criteria		Method for Measuring Project-level Effects on the Criteria
1	Natural Integrity	A measure of whether the long-term ecological processes of the area are intact and operating. Addressed by describing the effects a project may have on natural processes in the area.
	Natural Appearance	A measure of the degree of environmental modification that will occur because of a project. Addressed by describing the extent of modification that will occur in the area (e.g. length of roads built, facilities constructed) and how apparent the impact will be to the visitors of the area in both the short-term and the long-term.
2	Opportunities for Experiences Often Unique to Wilderness • Solitude • Challenge • Primitive Recreatio	Measured by the opportunity to be isolated from the sights, sounds, and evidence of humans, and experience a high degree of challenge and risk while using primitive outdoor skills. Addressed by describing how project activities might affect the size of the area, the number and type of primitive recreation opportunities available, the opportunity to experience natural quiet, and the addition or absence of facilities.
3	Special Features	Addressed by describing the effect proposed activities would have on other values of ecological, geologic, scenic or historical or cultural significance.
4	Description/Boundary Conditions/Manageability as Wilderness	A measure of the ability to manage an area as wilderness, the resulting configuration of the potential wilderness, and the interaction of the other elements above. Addressed by discussing how proposed activities may affect the boundary location, size, shape, and access to the area.

Considering the effects of the project against these criteria allows us to determine whether proposed activities would be of such intensity or duration that implementation would preclude future land use options, including possible wilderness recommendation.

It should also be noted that the process in the Forest Service Handbook for evaluating lands within IRAs for wilderness availability and need is inherently a part of land allocation planning (e.g. fully developed in the FEIS during Forest Plan revisions). Consequently, those criteria are not useful or practical in judging the effect of project-level actions on lands within an IRA and are thus not part of this analysis.

Affected Environment

The Kilkenny IRA identified in the 2005 Forest Plan inventory is 37,096 acres in size. Approximately 28,755 of these acres were identified in the earlier Roadless Area Conservation Rule inventory (USDA Forest Service 2000a). See Maps 2 and 3. The Mill Brook project proposes no activity on lands identified as part of the RACR inventory.

None of the Kilkenny IRA was recommended for wilderness designation in the Record of Decision for the revised Forest Plan (USDA Forest Service 2005c, pp. 25-26). Lands in this IRA were allocated to Management Areas 2.1, 6.1 and 6. 2. The 292-acre portion of the IRA that is in the project area is part of MA 2.1.

The Kilkenny IRA lies in the towns of Jefferson, Lancaster, Randolph, Berlin, Stark, Milan, and Kilkenny, New Hampshire. It is north of Route 2 and south of Route 110. There are currently 2.6 miles of forest roads in the IRA, for a density of 0.07 miles per 1,000 acres.

Recreation in the IRA consists primarily of hiking, backpacking and hunting. The area contains 31.2 miles of hiking trail, a remote cabin, and two backcountry tentsite locations.

The IRA is predominately composed of mature forest. To hikers and casual observers, the area appears predominantly unaffected by human activity, with the exception of the evidence of historic harvest activities, including old railroad grades and logging haul routes. Revegetation on these old roads is generally well-established. Since 1998, 405 acres have been harvested in the MA 2.1 portion of the IRA (approximately 1% of the total acres). The harvest was a mix of treatments, 157 of which were even-aged regeneration harvest.

There are off-Forest noise and visual intrusions, including highways, towns, motorized recreation, and timber operations. A full description of the Kilkenny IRA is available in Appendix C of the Forest Plan FEIS (USDA Forest Service 2005c, pages C-92 to C-100).

Direct and Indirect Effects

The analysis area for direct and indirect effects on inventoried roadless areas is the Kilkenny IRA. This single IRA was selected as the analysis area because the expected direct, indirect, and cumulative effects are localized and would not extend into any other IRA. The next closest IRA is the Great Gulf IRA, approximately 13 miles south of the project area as the crow flies. Due to the need to evaluate effects on natural appearance, the timeframe for this analysis is 20 years into the future because the 2005 FEIS demonstrates that it takes about 20 years for signs of timber harvest activities to "become essentially unnoticed by the casual visitor" (USDA Forest Service 2005b, p. 3-312). However, all other direct and indirect effects will last only for the actual duration of the Mill Brook project; expected to be 2-4 years depending on the alternative selected and sale operations. These direct and indirect effects are of a type that would not be expected to continue once the proposed activities are completed. The direct and

indirect effects of each alternative on indicators for inventory criteria and wilderness capability criteria are summarized in the project file.

The Mill Brook project does not set a national precedent by harvesting timber within an IRA identified during Plan revision; nor does it set a local or regional precedent. Other previous projects have harvested timber in inventoried roadless areas on the White Mountain National Forest, including the West Branch timber sales in the Kilkenny IRA, the Connor Brook sale in the Wild River IRA, and the Popple sale in the Presidential-Dry River IRA. Furthermore, implementing the activities proposed – including harvesting timber – does not constitute a commitment to take similar actions in any other White Mountain National Forest IRA or in any other inventoried roadless area in the country. As examples, the ongoing or recent Upper Ammonoosuc, Pond Brook, and Cat 16 sales were all located on lands that are not part of any roadless area inventory. This proposal was developed by local, District resource specialists after analysis of field information concerning the need for management in this HMU, and consideration of the Forest Plan goals, objectives, and desired condition. As noted in the specialist reports, the Mill Brook proposal is anchored in site-specific work: field analysis, determination of resource conditions, observation of effects, and results of past actions on adjacent lands. This proposal does not make similar actions in other IRAs on the Forest or elsewhere more or less likely. No other project action is dependent upon implementation of this proposal. The Mill Brook project is a stand-alone proposal tailored to address site-specific resource needs.

Alternative 1

As demonstrated below, selection of Alternative 1 (No Action) would result in no direct or indirect effects to lands in the Kilkenny IRA.

Direct/Indirect effects on the degree to which lands would meet IRA inventory criteria

Inventory criteria 1 and 2: Because the proposed actions would not occur, the area would continue to regain a natural, untrammeled appearance and appear to be largely affected by the forces of nature.

Inventory criterion 4: There would be no change in the relationship of the area to sources of noise, air or water pollution, or other effects on wilderness experience.

Inventory criteria 5 and 7: There would be no increase or decrease in miles of improved road, and the IRA would remain at less than 1% of the area harvested since 1997. Inventory criteria 3, 6, and 8: Ownership patterns would not change, no planting would occur, and no dwellings or access would be constructed.

If the no action alternative were selected the lands identified as the Kilkenny IRA would continue to meet the criteria for inclusion in a future inventory of roadless areas.

Direct/Indirect effects on the degree to which lands would meet wilderness capability criteria

Capability criterion 1: Because the proposed action would not take place, the area would retain the current degree of natural integrity and natural appearance.

Capability criterion 2: The present opportunities for experiences often unique to wilderness would remain.

Capability criteria 3 and 4: There would be no change to the special features of the area, and the ability to manage the area as wilderness would remain the same.

Because the project would not take place, selection of Alternative 1 would not preclude any future land use options, including the possibility of recommending some or all of the Kilkenny IRA for potential future wilderness designation.

Alternative 2

As demonstrated below, selection of Alternative 2 would result in short-term direct effects to certain lands in the Kilkenny IRA.

This alternative proposes timber harvest on approximately 292 acres in the IRA in Stands 2-10, 2-12, 2-16, 2-19, 3-31, 3-36, 3-13a, 3-16a, 4-15, and 4-34. A permanent wildlife opening would be created in stand 3-13a, and road classification and decommissioning activities would take place on FR's 199, 200, and 2205.2. The watershed restoration activities proposed in Alternatives 2 and 3 would take place entirely outside the IRA.

Direct/Indirect effects on degree to which lands would meet IRA inventory criteria

During and following implementation of Alternative 2 the area identified as the Kilkenny IRA would continue to meet all criteria for inclusion in a future roadless area inventory.

Inventory criterion 1: Timber harvest activities would result in skid trails, stumps, and openings, which would affect the natural, untrammeled appearance of this specific portion of the IRA. These effects would moderate over a period of 10 to 20 years as trees regenerate following harvest, except in Stand 3-13a which would be maintained as a permanent wildlife opening. Short-term effects to natural appearance would be greatest during actual harvest operations due to the presence of logging machinery and vehicles, and immediately following mowing or prescribed burning in stand 3-13a which would occur approximately every three to five years. Visual evidence of harvest activity does not automatically exclude lands from inventoried roadless areas (see criterion 7), and these proposed activities do not approach an intensity, duration, or permanence such that lands within the IRA would no longer meet criteria for inclusion in a future roadless area inventory as a result of project implementation.

Inventory criteria 2 and 3: No road construction would take place and ownership patterns would not change.

Inventory criterion 4: A short term increase in noise from timber harvest and truck traffic would occur within 1 to 2 miles of harvest activity for the duration of the project. This estimate is based on data and analysis gathered by recent studies that measured the decibel levels of various harvesting machinery and procedures for estimating decibel levels over distance from the specific source (Timerson 1999 and Neitzel and Yost 2003). The sound-to-distance estimate does not take into account the buffering effects of vegetation, wind, or topography; which would reduce the distance from the activity sound could be heard on any given day (Timerson 1999). Assuming the maximum distance of 2 miles, it is possible that noise could be audible on at most up to 9,250 acres (25%) within the 37,096-acre IRA. Ongoing prescribed burning or mowing of stand 3-13a would increase noise on approximately one day every three to five years. Due to proximity, only the southernmost (upstream) watershed restoration project would have any noise effect on the IRA, and only during implementation of the project. Machinery used in road work would be audible during that activity on

those roads. In contrast to a project that would create a permanent noise source (such as construction of a highway or airport) none of the sources in the Mill Brook project are permanent and all will occur in the context of current and ongoing use of NH Route 110 and FR 11 by cars, trucks, and snowmobiles, and other sources of noise such as airplane over-flights. There will be intermittent, localized noise effects on a small portion of the IRA. The majority of the IRA is not affected by potential noise from the project at all. Due to the temporary nature of the mechanized activity and the context with other noise sources in proximity to the area, lands within the IRA would continue to meet this criterion for inclusion in a future roadless area inventory.

As discussed in the Air Quality analysis (Section 3.2), a short-term increase in air pollutants can be expected due to exhaust from trucks, skidders, and harvesters, as well as from periodic wildlife opening maintenance using either mowing or prescribed fire. These are temporary sources of emissions and particulate matter and will occur in the context of larger sources such as vehicle and snowmobile use of FR 11 and NH 110, as well as industrial sources on a regional level. In this context, these relatively small-scale increases associated with the project would not be of such intensity or duration that lands within the IRA would not meet criteria for inclusion in a future roadless area inventory.

Forest Plan standards and guidelines, BMPs, project design features, and timber sale contract provisions are expected to prevent any negative effects to water quality as a result of harvest activity or other project activities. Consequently, lands within the IRA would continue to meet criteria for inclusion in a future roadless area inventory. Please see the Water Resources analysis (Section 3.12) for more information.

Inventory criterion 5: The Kilkenny IRA currently contains 0.07 miles of improved road per 1,000 acres (USDA Forest Service 2005b Appendix C p. 96). Proposed road classification and decommissioning actions would result in an overall reduction in road density under this alternative, to 0.06 miles per 1,000 acres.

Inventory criterion 7: Between 1998 and the present, 405 acres were harvested in the IRA, 157 of those were regeneration harvest. This constitutes less than 1% of the IRA harvested in the past 10 years. The Mill Brook project proposes to harvest 292 acres, 5 of which are even-aged regeneration harvest, which constitutes approximately 0.7% of the IRA. This would bring the total harvested within a 10-15 year period to approximately 1.7% of the IRA, well below the 20% threshold within a 10-year period.

Inventory criteria 6 and 8: The project does not propose planting non-native vegetation, and no dwellings or access would be constructed in the IRA.

As a result, the effects associated with inventory criteria 5, 6, 7, or 8 are such that lands within the IRA would continue to meet criteria for inclusion in a future roadless area inventory following implementation of Alternative 2.

Direct/Indirect effects on the degree to which lands would meet wilderness capability criteria

Capability criterion 1: As described above, timber harvest, and road decommissioning would result in modification of the natural appearance of approximately 292 (0.7%) of the 37,096 acres in the IRA. These activities would be apparent only to visitors traveling off-trail in the IRA during the project for a period of 10 to 20 years following implementation. During this 10-20 year period, the land would increasingly regain the appearance of an unmodified forest landscape (USDA 2005b, p. 3-312). The permanent

wildlife opening would appear as a natural variation in the landscape except during and immediately following maintenance activities. Most visitors would not recognize or take note of it.

The limited scope of this project is not expected to have any effect on the long-term ecological processes in the IRA, as discussed in specific resource analyses in this document.

Due to the limited area of activity and the natural recuperative abilities of the land, implementation of Alternative 2 is not expected to affect natural appearance or integrity such that the option of considering this portion of the IRA for any future land use, including possible wilderness recommendation, would be precluded.

Capability criterion 2: Localized noise associated with harvest would be audible within approximately 1-2 miles of stands proposed for harvest in and adjacent to the IRA. This could affect the opportunity to experience solitude on at most approximately 9,250 acres of the IRA (Timerson 1999, Neitzel and Yost 2003). Noise associated with harvest operations would occur primarily during fall and winter when human use of the area is lowest, and primarily in areas away from trails. Only visitors traveling in the area during fall and winter when operations are in progress in this specific portion of the IRA would experience effects to the opportunity for solitude. This effect would cease following operations. Visitors near the FR 2204 watershed restoration project when operations are ongoing would hear the sound of machinery which would similarly affect the experience of solitude. Ongoing maintenance of the permanent wildlife opening in stand 3-13a would affect the opportunity for solitude on one day in early spring or in the fall approximately every three to five years. Opportunities for challenge and primitive recreation would not change due to harvest activities, though hunting would likely be affected during harvest operations. See Recreation, Section 3.7 for more information.

Effects to this capability criterion are limited in area (at most 9,620 acres and likely much less due to terrain, vegetation, wind, and weather), are temporary in nature (approximately 2-4 years depending on harvest operations, and 1 day every 3-5 years for wildlife opening maintenance) and would occur during the lowest-use times of the year. They must also be viewed in the context of other ongoing sources of noise such as vehicle use of NH 110 and FR 11. In this context, the limited and temporary nature of the effects associated with Alternative 2 would not preclude any future land use option, including the possibility of wilderness recommendation, as a result of implementation.

Capability criterion 3: The only special features identified in the IRA are scattered occurrences of rare plants. Since project activities will avoid populations of rare plants, no effects on this characteristic are expected. See Section 3.16 for more information on rare plants.

Capability criterion 4: As described in the effects to IRA inventory criteria section above, lands currently within the Kilkenny IRA would continue to meet inventory criteria following implementation of Alternative 2, and this alternative would not change existing access to the area. Thus, management and boundary considerations would remain the same as prior to project implementation.

To summarize, none of the activities proposed in Alternative 2 and the resulting effects are of either an intensity or duration such that lands within the Kilkenny IRA would cease to meet criteria for inclusion in a roadless area inventory. Nor would these effects

preclude any future land use option – including the option of potential wilderness recommendation – for lands within the Kilkenny IRA.

Alternative 3

As demonstrated below, selection of Alternative 3 would have no direct effects and only short term indirect effects to certain lands within the Kilkenny IRA.

Direct/Indirect effects on the degree to which lands would meet IRA inventory criteria

Inventory criteria 1 and 2: Because no activities would occur in the IRA, the area would continue toward the appearance of a natural, untrammeled area largely affected by the forces of nature.

Inventory criterion 4: Timber harvest in stands outside the IRA would result in indirect, short-term, and localized noise that could be audible in a section of the IRA within 1-2 miles of harvest operation (approximately 4,806 acres within the IRA at maximum), and the possibility of minor air pollution associated with vehicle and machinery exhaust. These effects would occur primarily during fall and winter when human use of the IRA is lowest, and would cease with completion of harvest operations in these stands. The effect of these activities would be less than in Alternative 2 because no harvest would occur in the IRA. The effect of the watershed restoration project would be the same as in

Alternative 2

Inventory criteria 3, 5, 6, 7, and 8: There would be the same reduction in road density as in Alternative 2 (0.06 miles per 1,000 acres) and the IRA would remain at 1% of the area harvested since 1998. Ownership patterns would not change, no planting would occur, and no dwellings or access would be constructed.

Under Alternative 3 fewer activities would take place than in Alternative 2 and all would occur on lands outside the IRA. Since it has been demonstrated that under Alternative 2 the lands within the Kilkenny IRA would continue to meet criteria for inclusion in a future roadless inventory, it follows that lands currently within the IRA would meet criteria for inclusion in a future inventory with selection of Alternative 3 as well.

Direct/Indirect effects on the degree to which lands would meet wilderness capability criteria

Capability criterion 1: Because no harvest or wildlife opening maintenance actions would occur in the IRA the area would retain the current degree of natural integrity and natural appearance. Road decommissioning activities would have a temporary effect on natural appearance during implementation, but the intent of this activity is to remove these unneeded constructed features as a long term restoration of the natural appearance of the area.

Capability criterion 2: As described in Alternative 2, the noise and possible minor air pollution associated with harvest activities in stands outside the IRA could affect the opportunity for solitude in a portion of the IRA within 1-2 miles of harvest operation (approximately 4,806 acres at most potentially affected). These effects would occur primarily during fall and winter when human use of the IRA is lowest, and would cease with completion of operations. This effect would be less than with Alternative 2 because the alternative proposes fewer overall activities and these are located on lands

outside the IRA. Mechanized noise associated with implementation of the watershed project would have the same affect as in Alternative 2.

Capability criterion 3 and 4: For the reasons stated in Alternative 2, there would be no change to the special features of the area, and the ability to manage the area as wilderness would remain the same.

Because proposed activities would take place outside the IRA and the effects of adjacent activities would be temporary and limited to the duration of the project, implementation of Alternative 3 would not preclude any future land use options, including possible wilderness recommendation, of lands within the Kilkenny IRA.

Cumulative Effects

The analysis area for cumulative effects on inventoried roadless areas is the Kilkenny IRA. This is the same as the analysis area for direct and indirect effects and the rationale for using this area is the same. The temporal scope for the analysis is the past decade, present, and foreseeable future (20 years). We examine activities over the past decade because the Forest Service Handbook uses this period of time as a basis for evaluating whether lands meet IRA inventory criteria. The analysis looks 20 years into the future because the 2005 FEIS states that it takes about 20 years for signs of timber harvest activities to "become essentially unnoticed by the casual visitor" (USDA Forest Service 2005b, p 3-312). This allows consideration of the cumulative effect of foreseeable activities on conditions and opportunities in the IRA. Past, on-going, and foreseeable future projects are identified in Section 3.1.

Cumulative effects on the degree to which lands would meet IRA inventory criteria

Alternative 1 Because no proposed activities would occur under Alternative 1, there would be no cumulative effects associated with this project on the Kilkenny IRA.

Alternative 2 Inventory criteria 1 and 7: Harvest of 292 acres within the IRA would occur under Alternative 2, and this activity would cumulatively affect inventory criteria 1 and 7 due to the addition of these harvest acres to the total of 405 acres since 1998. There are currently no timber harvest activities planned within the IRA for the foreseeable future. Consequently, total harvest acres over this 30-year timeframe would constitute less than 2% of the IRA – well below the 20% threshold within a 10-year period for this criterion. The direct/indirect effects analysis found that even with the addition of these harvest acres to those harvested in the past, lands within the IRA would continue to meet criteria for natural appearance and percentage of the area harvested within a ten-year timeframe in a future inventory. Since no timber sales are planned for the foreseeable future, it follows that the cumulative effect would be the same as the direct and indirect effects; lands within the IRA would continue to meet these criteria in any future inventory. There is no private land harvesting that would affect the IRA.

Inventory criterion 4: As stated in the direct effects section, it would be possible to hear noise within 1-2 miles of harvest activities, and there would be minor air pollution associated with vehicle and machinery exhaust and periodic prescribed fire. These effects could be magnified if activities were to occur simultaneously with certain stands in the Pond Brook or Upper Ammonoosuc timber sales. However, this project does not establish a permanent, irretrievable source of mechanized noise or air pollution within

or in proximity to the IRA and will occur in the context of current and ongoing use of NH Route 110 and FR 11 by cars, trucks, and snowmobiles, and other sources of noise such as airplane over-flights. Effects would be limited in duration to the length of harvest operations, and one day every 3-5 years. Consequently, there would be no cumulative increase in noise or air pollution that would result in lands no longer meeting this inventory criterion. Since no direct or indirect effects are expected related to water quality, no cumulative effects are expected either.

Because Alternative 2 would have no direct or indirect effects on inventory criteria 2, 3, 6, and 8, there would be no cumulative effects on these criteria either. The cumulative effect of road authorization and decommissioning activities would be the same as the direct effect – a reduction in road density to 0.06 miles per 1,000 acres (inventory criterion 5).

Even in combination with past, present, and reasonably foreseeable actions, following selection of Alternative 2 lands within the Kilkenny IRA would continue to meet all criteria for inclusion in a future roadless inventory.

Alternative 3 Inventory criterion 4: Because harvest activities would occur outside but adjacent to the IRA with selection of Alternative 3, there would be similar, though lesser effects associated with noise and air pollution as with Alternative 2. Because lands within the IRA would continue to meet this inventory criterion with selection of Alternative 2, it follows that the same would be true of Alternative 3 which proposes fewer activities.

Inventory criterion 5: The cumulative effect would be the same as the direct effect, a net loss of 0.3 miles of Forest Roads for a density of 0.06 miles per 1,000 acres.

Inventory criteria 1, 2, 3, 6, 7, 8: Since there were no direct or indirect effects associated with these criteria, there would be no cumulative effects either.

Cumulative effects on the degree to which lands would meet wilderness capability criteria

Alternative 1 Because no proposed activities would occur under Alternative 1, there would be no cumulative effects associated with this project on the wilderness capability characteristics of the Kilkenny IRA.

Alternative 2 Capability criterion 1: In combination with past, present, and future activities, Alternative 2 would affect the natural appearance of the area due to harvest activity on 292 acres of the IRA, road decommissioning activities, and permanent wildlife opening maintenance. However, as described in the direct/indirect effects section, the evidence of these activities would moderate over time, eventually regaining the appearance of an unmodified forest. This is shown by the gradual recovery of other harvests in the area. Further, since no reasonably foreseeable future timber projects are planned within the IRA and the direct effects would not preclude any future land use decision, it follows that the cumulative effect of this project on the natural appearance of the area would not preclude any future land use decision, including possible wilderness recommendation. Additionally, the limited scope of this project is not expected to have any effect on the long-term ecological processes in the IRA, even when combined with past, present, and reasonably foreseeable future actions, as discussed in specific resource analyses in this document.

Capability criterion 2: There could be a cumulative effect to the opportunity for solitude in a portion of the IRA within 1-2 miles of harvest activities in combination with the sound effects of the watershed restoration project or the adjacent Pond Brook and Upper Ammonoosuc timber sales, if harvest operations and watershed restoration work were to occur simultaneously. To experience a cumulative increase in the sound of machinery from within the IRA, a visitor would need to travel off-trail during the fall or winter to a location within 1-2 miles of stands within these separate sales that were being harvested simultaneously. Moreover, these effects would be short-term and would cease following the completion of these projects (2-4 years). The direct and indirect effects of the activities in this alternative would not alter opportunities for challenge and primitive recreation; thus there would be no cumulative effects on these opportunities either. Due to the temporary nature of the effects from mechanized noise and minor air pollution on the opportunity for solitude, selection of Alternative 2 would not preclude any future land use options, including possible wilderness recommendation, for lands within the Kilkenny IRA.

Capability criteria 3 and 4: The activities in the IRA would not cumulatively affect special features (criterion 3) because there are no direct or indirect effects on these features. The cumulative effects on boundary and management considerations (criterion 4) are the same as the direct and indirect effects.

Alternative 3 Capability criterion 2: The cumulative effect on solitude resulting from noise and air pollution would be similar, though lesser than with Alternative 2 due to fewer proposed activities and all located outside the IRA. Since no direct or indirect effects to opportunities for challenge and primitive recreation are anticipated, no cumulative effects would result either.

Capability criteria 1, 3, 4: Because activities would take place outside the IRA, other than the slight change in appearance due to decommissioning of sections of FR 199 and FR 200 there would be no direct and indirect effects on the natural integrity or appearance of the IRA (criterion 1), the identified special features (criterion 3), or the boundary or management considerations (criterion 4) of the area. Consequently, there would be no cumulative effects either.

Selection of Alternative 3 would not preclude any future land use decision, including possible wilderness recommendation, for lands within the Kilkenny IRA.

3.6 Non-Native Invasive Plants

The following analysis summarizes the information contained in the report entitled "Non-Native Invasive Species And Wildlife Report And Summary Of Biological Evaluation For Federally Endangered, Threatened, and Proposed Species and Regional Forester Sensitive Species for the Mill Brook Project" completed by the District Wildlife Biologist. The Report is located in the project file along with all supporting documentation and data used in this analysis.

Affected Environment

Where present and uncontrolled, non-native invasive species (NNIS) pose a serious threat to plant and animal community health and diversity. The White Mountain National Forest has been working with the New England Wild Flower Society to determine species and locations of non-native invasive plants. Findings to date have produced a list of invasive species that exist on or near the White Mountain National Forest. The majority of NNIS locations are on the perimeter of the national forest, primarily along roads, highways, and in developed areas such as towns, residential areas, and recreation areas.

Coltsfoot (Tussilago farfara) was located during project surveys near Stand 4-15 (2005 unpublished WMNF botany reports). While populations of coltsfoot are watched, it is currently not a species targeted for control. Coltsfoot has been documented across the Forest, but no infestations are in any way encumbering the natural functioning of plant or animal communities nor imperiling any common or rare species (Mattrick personal communication 2006).

There is always potential for spread of NNIS in to an area from traditional uses such as hunter, hikers, bikers, campowners and other recreational users. The NNIS Report in the project file provides an overview of plant competition, modes of spread, and where NNIS populations are expected to be found in a working forest environment. In general, roads, trails, skid trails, developed areas such as campgrounds, and riparian areas serve as conduits for non-native invasive plants.

During the development of the 2005 Forest Plan, the best available science was used to develop goals, objectives, standards, and guidelines for NNIS on the White Mountain National Forest. The analysis used to evaluate effects to NNIS for this project incorporates by reference information from the Forest Plan and FEIS (USDA Forest Service 2005a and USDA Forest Service 2005b), as well as literature cited in this EA and the NNIS report in the project file, which is part of the Wildlife Report.

Measuring Effects to NNIS

The relevant element of NNIS to the Mill Brook project is the presence in or near the project area and the amount of habitat being created that is suitable for infestation. Presence is determined through field surveys and records from previous analyses. Risk of introduction and spread are measured by the amount of expected use of vehicles and heavy equipment.

Forest Service regulations (FSM 2080.44.6 and 2081.03) require that we determine the risk of introduction or spread of NNIS from any proposed activities, in particular ground-disturbing activities. Executive Order 13112 (February 3, 1999) prohibits any action that may 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.

Determination of Risk: Because introduction and spread are controlled by application of standards and guidelines (USDA Forest Service 2005a, Chapter 2, pages 11-12), and the only known NNIS population in the project area (coltsfoot) is of low concern, the overall risk rating assigned for the Mill Brook project is "Low" (NNIS Risk Assessment in Project File).

Direct and Indirect Effects

The Analysis Area for direct and indirect effects on non-native invasive species is the project area, because this is where vehicles and equipment will have access and operate on the ground. These vehicles and equipment, as well as gravel, seed and mulch brought to the project area from off-site are the most likely entry for non-native invasive species (NNIS).

The temporal scope for direct and indirect effects on non-native invasive species is the time period that encompasses active harvest operations and connected actions that cause ground disturbance because this is when NNIS would most likely be introduced into the project area. This is estimated to be approximately 3 to 5 years for timber harvest (timber sale contracts are typically 3 years in length) and road work and 10 years for the watershed restoration work and stumping the newly created permanent wildlife openings (projects would be implemented up to 5 years after the timber sale contract ends).

Alternative 1

Alternative 1 would not introduce new migration routes or sites for invasive species. There would be no direct or indirect effects from timber harvest, road restoration, watershed restoration, construction and reconstruction of landings and skid trails, installing temporary stream crossings, removing culverts along decommissioned roads, watershed restoration, and stumping the new permanent wildlife openings. NNIS could still be introduced by vehicles traveling on roads in the project area, or through road maintenance activities.

Alternatives 2 and 3

Implementing standards and guidelines would reduce but not eliminate the possibility of introducing or spreading NNIS from proposed activities including timber harvest, road and landing work, skid trails, installing temporary stream crossings, removing culverts along decommissioned roads, watershed restoration, and stumping the permanent wildlife openings. The risk of introducing or spreading NNIS along roadsides by vehicles or some type of heavy equipment would be greatest under Alternative 2 because it proposes more road and landing work, more stumping, and more skid trails than Alternative 3.

The potential for NNIS to migrate into the project area from surrounding areas is greatest in clearcuts where the canopy is removed, but overall the risk of migration is very low as there are no established NNIS species in or adjacent to any of the stands proposed for treatment. The potential for migration is slightly greater under

Alternative 2, which proposes 56 acres of clearcuts/patch cuts while Alternative 3 proposes 51 acres of clearcuts/patch cuts.

Cumulative Effects

See Map 7 and Section 3.1 for location and projects considered in the following cumulative effects analysis.

The Analysis Area for cumulative effects for NNIS is the same as described in Section 3.11 for Vegetation: the Mill Brook HMU, South Pond HMU, the private inholdings in both HMUs, and adjacent private land in the Towns of Stark and Northumberland. This area is appropriate because any NNIS occupying this area serves as a potential source population for accidental introduction into the project area via wind, wildlife, or human activities and use.

The temporal scope for cumulative effects NNIS is ten years in the past and ten years in the future (1998 to 2018). For NNIS this allows consideration of temporary openings established by timber harvest over the past ten years (anything over ten years will have re-established a canopy, blocking sun from shade intolerant NNIS plant species), the ten years it will take the temporary openings established under both Action Alternatives to re-establish a closed canopy, and construction and residential development that may have or could introduce NNIS during this period. This time frame also allows consideration of the invasive plant inventory conducted by the New England Wildflower Society during 2001 and 2002 that covered 220,000 acres across the National Forest and adjacent lands (USDA Forest Service, 2005b, pp. 3-154 to 3-158).

Alternatives 1, 2, and 3

Known populations of Japanese knotweed near the Fish Hatchery in the South Pond HMU on Forest Service lands were controlled and will be monitored for any further control needs. These infestations are not near the Mill Brook or North Kilkenny Vegetation Management project area. There are several infestations of NNIS on private lands in the Towns of Stark and Northumberland but not directly adjacent to the project area. Documented NNIS in these locations include winged euonomys, Japanese knotweed, goutweed, and coltsfoot.

The risk of having NNIS spread onto Forest Service lands in the cumulative effects analysis area from activities proposed on Forest Service lands is low as there are few known populations of NNIS on the Forest, and application of standards and guidelines in areas with proposed or planned activities will minimize the risk of spreading NNIS.

There is a greater likelihood of introducing and/or spreading NNIS as a result of activities on private lands. There also is a risk of NNIS becoming established in harvest areas on adjacent private lands. The New Hampshire Best Management Practices provide no specific guidelines for reducing or controlling the introduction or spread of NNIS through activities associated with timber harvest (www.dred.state.nh.us/divisions/forestandlands/reference).

3.7 Recreation

The following analysis summarizes the information contained in the report entitled "Mill Brook Project Recreation Specialist Report" completed by the Assistant Ranger for Recreation. The report is located in the project file and contains supporting documentation and data used in this analysis.

Affected Environment

See Map 6. The project area is used for hiking, biking, snowmobiling, hunting, fishing, and wildlife watching, primarily by local residents and camp owners. In addition to the recreation facilities in the project area (described below), recreation facilities adjacent to the project area include the South Pond recreation area, the Rocky Pond snowmobile trail, portions of three hiking trails (Kilkenny Ridge, Devil's Hopyard, and Unknown Pond), and backcountry tentsites at Unknown Pond and Roger's Ledge.

Recreation and vegetation management activities have co-existed here for many years. Roads originally constructed for logging support recreational uses such as snowmobiling and access for hiking and other activities. Timber harvest enhances hunting opportunities, and creates openings enjoyed as scenic vistas.

There are private camps on national forest land managed under Special Use Permit on Forest Road 11E and U-1003. There are also leased camps on private land along road 2204.

Snowmobile Trail

The Mill Brook snowmobile trail runs concurrent with FR 11 (the Mill Brook Road). This stand-alone, dead-end trail does not link to the overall trail system, is typically not groomed, and has regularly been plowed due to timber harvest on private inholdings.

Hiking Trail

Approximately .15 miles of the Unknown Pond trail is in the project area within one quarter mile of Stands 4-15, 4-34, 3-16a, and 3-13a. This trail is in Trail Use Area 6, generally the lowest use backcountry area on the Forest (USDA Forest Service 2005b, pp. 3-341, 3-342).

Other Recreation Components including the Old Road

The trails, roads, and general backcountry areas are used for Nordic skiing, snowshoeing, dog sledding, and mountain biking. The Old Road is used by local residents to access Mill Brook, and also receives occasional illegal motorized use by ATVs.

The Forest Service describes the range of available recreation opportunities in terms of the Recreation Opportunity Spectrum (ROS) settings assigned to particular areas. The ROS goals and settings are detailed in the Forest Plan, p 1-10 and Map 1-11 and in the FEIS, p. 3-307 and Appendix H. The primary settings in the project area are Roaded Natural and Semi-Primitive Motorized.

Measuring Effects to Recreation

The relevant recreation elements for the Mill Brook project are:

- Snowmobiling: measured by miles impacted by timber operations and changes in scenery;
- Hiking: measured by noise, changes in scenery, number and miles of trails affected;
- Hunting: measured by changes in opportunity and habitat; and
- Other recreation: measured by changes to ROS classes.

The activities in the Mill Brook project that could affect these elements are: timber harvest, road and landing work, prescribed fire, and watershed restoration.

Direct and Indirect Effects

The Analysis Area for direct and indirect effects on recreation is defined as the Mill Brook project area. The timeframe for this analysis is 20 years into the future because the 2005 FEIS demonstrates that it takes about 20 years for signs of timber harvest to "become essentially unnoticed by the casual visitor" (USDA Forest Service 2005b, p. 3-312). This timeframe was selected in recognition that the visual evidence of timber harvest may affect the recreation experience of the area. However, all other direct and indirect effects will last only for the actual duration of the Mill Brook project; expected to be 2-4 years depending on the alternative selected and sale operations. This area and duration were selected because the direct and indirect effects on recreation activities are primarily related to harvest operations and will essentially cease when the harvesting operation is complete.

Alternative 1

Alternative 1 would not alter current recreation opportunities. Winter recreation use of the Mill Brook Snowmobile Trail would not be affected by harvest activities; however, timber harvest on private inholdings in the project area could affect this use. Users of the Unknown Pond Trail would not hear or observe activities associated with timber harvest except that which may occur on private land. Silvicultural prescriptions designed to improve wildlife habitat would not occur; as a result hunting opportunities would not noticeably change. Other proposed activities related to watershed improvement, permanent wildlife opening maintenance, or road restoration or decommissioning would not take place and would not alter informal recreation opportunities or future trail development.

Alternatives 2 and 3

These alternatives are very similar in terms of direct and indirect effects on recreation activities and opportunities. The differences are discussed below.

Snowmobiling — Mill Brook Trail

Use of the Mill Brook snowmobile trail would be directly affected by harvest activities because winter harvesting will require that FR 11 be plowed, with snowmobiling prohibited during operations (see Design Features in Section 2.5). Operations will likely occur throughout the winter, including weekends and holidays. While this will have a short-term effect on snowmobiling on this one trail, it should reduce the overall impact by reducing the total amount of time needed to complete the timber harvest.

Foreground views from some portions of the trail would change following harvest (see Scenery analysis in Section 3.8). Evidence of recent timber harvest activity would be evident following operations.

Other proposed activities would not directly or indirectly affect snowmobile trails.

Hiking— Unknown Pond Trail

Under Alternative 2, hikers on the first half mile of the Unknown Pond trail may hear and observe timber operations in nearby stands up to 2 miles from the trail (Timerson 1999 and Neitzel and Yost 2003). However, there would be little effect on hikers because most operations would occur during fall and winter when hiking use is low. Changes in the vegetative composition following harvest may be evident to some visitors, though not from the trail. Other proposed activities would not have a direct or indirect effect on hiking activities or hiking trails in the area. Smoke and traffic from prescribed fire in Stand 3-13a may be apparent to hikers.

Under Alternative 3, no harvest would take place in stands 3-13a, 3-16a, 4-15, or 4-34, leaving the closest harvest nearly one mile from the trail. Hikers on the trail would not see evidence of timber harvest but may hear timber harvest operations in the distance.

Hunting

Harvest operations will disrupt hunting in active logging areas, however since Alternatives 2 and 3 would establish early-successional habitat and expand and maintain permanent wildlife openings, future habitat and browse for certain game species would increase following timber harvest. Other proposed activities would not directly or indirectly affect hunting opportunities.

Other Recreation Activities including use of the Old Road

Watershed restoration work on the Old Road would affect informal foot travel along approximately 500 feet of this route by roughing up and adding woody debris to the roadbed.

Roads and trails would remain open to foot travel, however logging activity would affect winter use –especially along roads plowed for timber haul because foot travelers would be affected by log truck traffic. Caution signs would be placed as necessary to alert visitors to logging operations. Noise associated with harvest activity may be apparent to visitors within one or two miles of logging operations.

Direct and indirect effects of proposed activities would not appreciably alter the setting or experience characterizations of the Roaded Natural or Semi-Primitive Motorized ROS classes in this area. All of the proposed activities are consitent with the ROS classes in the area.

In the short-term, timber harvest activity would affect some recreation opportunities especially snowmobiling. However, because past timber harvest activities have occurred in this and other similar analysis areas without long-term changes to recreation activities and opportunities, this project is not expected to result in an overall change to the recreation experience available in the area.

Cumulative Effects

See Map 6 and Section 3.1 for location and projects considered in the following cumulative effects analysis.

The Analysis Area for cumulative effects on recreation consists of the Mill Brook and South Pond HMUs. The timeframe is 10 years in the past 10 years in the future (1998-2018). This timeframe was chosen to be consistent with the cumulative effects time frame for Vegetation because timber harvest activity has the most potential to affect recreation. Past projects which had an effect on recreation include the War Camp, McCordick Brook, Fogg Brook and Little Mac timber sales, the Rocky Pond snowmobile trail construction project, the South Pond parking area repaving project and the Unknown Pond tentsite project. Present and future projects in the analysis area which could have a cumulative effect on recreation include the ongoing Higgins Brook timber sale and the future Upper Ammonoosuc and Pond Brook timber sales (analyzed in 2006 as the North Kilkenny project). The Higgins Brook project began in 2004 and is expected to end in 2007 or early 2008. The Upper Ammonoosuc timber sale could commence in 2008 and last until approximately 2012. The Pond Brook timber sale could commence in 2008 and last until approximately 2012. Harvest operations have occurred on private inholdings accessed by FR 11, and about 200 acres of shelterwood harvest could occur on private inholdings in these two HMUs in the next 10 years. Additional planned work includes rehabilitation of the South Pond recreation area water system, and maintenance to trails, roads, and permanent wildlife openings.

Alternative 1

Since Alternative 1 would result in no change to existing recreation activities the cumulative effects of this alternative would also result in no change to recreation activities and opportunities.

Alternatives 2 and 3

Neither alternative would change overall recreation opportunities in the Mill Brook area. While operations are active, visitors may encounter logging truck traffic on roads and noise from the Mill Brook, Upper Ammonoosuc, and Pond Brook projects, primarily during fall and winter within 1-2 miles of actual harvest operations. Visitors may also encounter the sights and sounds of harvest activities on private inholdings. Past projects in the analysis area either had minimal effect on recreation due to the distance from recreation facilities and trails or in the case of the Rocky Pond Trail construction, South Pond repaving, and Unknown Pond projects, directly enhanced recreation opportunities in the area. Wildlife habitat benefits associated with the timber sale projects have cumulatively increased opportunities for hunting and wildlife viewing. The effects on recreation from timber harvesting largely cease when the harvest operations ended.

This project combined with the ongoing Higgins Brook timber harvest and the future Upper Ammonoosuc and Pond Brook projects would increase cumulative effects on snowmobile use of the area. Riders on the Rocky Pond snowmobile trail currently encounter dual use (logging vehicles and snowmobiles sharing a road or trail) on approximately 0.5 miles of FR 460 from the junction with FR 2285.1 to FR 104. Riders accessing this trail from the end of the Spruceville Road encounter approximately another 0.4 miles of dual use. The Upper Ammonoosuc and Pond Brook sales will

affect an additional 2.9 miles of this trail. The 4.7 miles of the Mill Brook snowmobile trail (concurrent with FR 11), a local route which is lightly used, rarely groomed for riding, and often plowed to accommodate timber harvest on private inholdings, would be closed for the duration of the winter harvest under Alternative 2. Cumulatively, up to approximately 8.5 miles of snowmobile trail would be affected over the next 5-8 years (3.8 miles of dual use and 4.7 miles of temporary trail closure), however, it is highly unlikely that the full 8.5 miles would be simultaneously impacted by harvest operations. Under Alternative 3, fewer miles of FR 11 would be plowed; but because it is not practical to open only the last 1.3 miles of this dead-end snowmobile trail the effects would be the same as in Alternative 2. It should also be emphasized that while the Rocky Pond Snowmobile Trail is connected to the overall system, the Mill Brook Snowmobile Trail is a stand-alone, dead-end trail.

Cumulative effects on hiking would be very low because hiking trails remain open to foot travel during harvesting operations. The number of trails and total trail miles affected cumulatively is very small compared to the extent and range 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. Because of their distance from the project area there would be no cumulative effects on remote tentsites at Unknown Pond and Roger's Ledge. Cumulative effects to the South Pond recreation area, biking, hunting, fishing, and other recreation opportunities as well as the setting and experience characteristics of the Semi-Primitive Motorized ROS class are not anticipated because there are no measurable direct or indirect effects on these recreational activities.

Because there were no direct or indirect effects to recreation opportunities resulting from other proposed activities, there would also be no cumulative effects.

3.8 Scenic Resources

The following analysis summarizes the information in the project file, which includes data and modeling results in support of the Forest's Scenery Management System used in this analysis.

Affected Environment

The goal of scenery management on the White Mountain National Forest is to "conduct all management activities to be consistent with assigned Scenic Integrity Objectives, realizing the importance to local communities and Forest users of a natural-appearing landscape, distinct from the human-made environment dominant in the East." (USDA Forest Service 2005a p. 1-16). The Forest Plan describes the scenery management system with the range of scenic integrity objectives, concern levels, and scenic classes that allow varying levels of scenery changes as viewed from roads, trails, and viewpoints (USDA Forest Service 2005d).

In the Mill Brook project area, concern levels vary from high to low. For example, the Unknown Pond trail has the highest level of concern, while the views from the roads in the project area are the lowest concern because they average less than 50 vehicles per day.

Two viewpoints outside of the project area -- Devil's Slide and Roger's Ledge -- offer limited views of the proposed treatments. The project record includes analysis showing the projected views from the two high viewpoints as well as viewpoints along FR 11. Devil's Slide is an open peak accessed by a local, low-use trail north of Stark Village and looks southward into the Mill Brook area. The projected views were analyzed with and without a reserve area of trees in Stand 2-34b. Roger's Ledge is located on the moderately-used Kilkenny Ridge trail to the southeast of the proposed treatments with views to the north and west. See Map 6.

Measuring Effects to Scenic Resources

The relevant elements of scenic resources in the Mill Brook project are changes in scenery as viewed from roads, trails, and the two higher elevation viewpoints of Devil's Slide and Roger's Ledge. Forest Plan standards and guidelines establish thresholds for observed acres depending on harvest prescription, scenic integrity objectives, concern levels, and scenic class (USDA Forest Service 2005d). Effects to scenic resources are measured by observed acres of new openings and textural changes in the forested landscape.

Project activities that could have a measurable effect on scenic resources would be timber harvest, which would create new openings in the forested landscape and could be visible from roads, trails, Roger's Ledge, and/or Devil's Slide. The other proposed activities would not create openings or textural changes in the scenery and so would not have any measurable effects

Direct and Indirect Effects

The Analysis Area for direct and indirect effects on scenic resources includes the MA 2.1 lands in the project area, private inholdings in the project area, and associated viewpoints. This area is where the proposed activities affecting scenery would take place, potentially affecting the view.

The temporal scope for direct and indirect effects on scenic resources is 10 years past and 20 years into the future (1998-2028) from when the project could occur. This period allows consideration of whether, or how much, the project activities are still evident on the landscape. The analysis looks 20 years into the future because the 2005 FEIS states that it takes about 20 years for signs of timber harvest activities (excluding those which create permanent openings for wildlife) to "become essentially unnoticed by the casual user" (USDA Forest Service 2005b p 3-312).

Alternative 1

No harvesting is proposed under Alternative 1. With this alternative, there would be little or no change in the visual environment from the existing conditions. Any changes in the existing forested landscape would result from natural causes. As areas harvested during earlier sales reach maturity, the existing mosaic pattern resulting from those activities would be replaced by a consistent vegetative texture with few naturally occurring openings. Without new openings in the canopy, either through human manipulation of the canopy or natural occurrences, the vegetation would not offer as much diversity of tree species, such as paper birch and aspen, or age classes as there would be if openings where present. There would be no direct and indirect effects on scenic resources.

Alternatives 2 and 3

The direct impacts of timber harvest would be short-term textural changes in the existing tree canopy as seen from the primary viewpoints of roads, trails, Devil's Slide, and Roger's Ledge. Even-aged management offers more textural change than uneven-aged management. The size, position, and design of even-aged treatments would have some short-term direct effects on visual aesthetics, but these are minimized by scattering the openings across the landscape, creating irregular shaped harvest areas and feathering the edges, and leaving groups of reserve and wildlife trees throughout the area. Some of the proposed even-aged treatments would be visible from FR 11, Roger's Ledge, and Devil's Slide but, since there are existing similar treatments already visible from the viewpoints, they would not represent a dramatic change to the landscape.

Individual-tree, group, and improvement cut selection treatments would remove about 1/4 of the basal area. The stands would continue to appear natural, and would regain foliar density within a few years as forest floor vegetation grows back and tree canopies increase in size due to the added sunlight. Uneven-aged management may enhance visual quality by extending the view into the stand.

Observed acres of openings for Alternatives 2 and 3 were generated from a computerized visual analysis model and confirmed with on-site visits and photos. These results are in the project file. The Scenic Resources Report in the project file includes details and data regarding visibility of even-aged harvest areas and acres of openings from the FR 11, Devil's Slide, and Roger's Ledge, showing that predicted new observed openings would be below the Forest Plan threshold. Alternative 3 would have about four fewer acres of visible openings seen from the FR 11 and Roger's Ledge viewpoints than Alternative 2. By designing irregularly shaped units and conforming to the topography, the Forest Service is able to minimize visual impacts. All of the stands proposed for even-aged management would meet the Scenery Management Guidelines for all analyzed viewpoints as outlined in the Forest Plan.

The Mill Brook Road (FR 11) viewpoint for stands 3-13a and 3-16a is located at a rock barricade and waterbar beyond a turn-around at the end of the road, which stops traffic from entering the existing landing. The understory of Stand 3-16a along the road is very dense, barring anything but limited views of the harvested area.

Portions of stands 3-13a and 3-16a are visible looking west from Roger's Ledge. Recent harvesting of 250 acres of private inholding is not visible from the high traffic areas of this viewpoint.

Stand 2-29a is buffered by a strip of vegetation along the road, but is expected to be visible during leaf-off periods.

Harvesting activities would not be visible from the Unknown Pond Trail. Even-aged treatments would not visible from the portion of Mill Brook eligible for Scenic classification under the Wild and Scenic Rivers Act (see Section 3.13). Harvests in Stands 2-12, 2-19 (not treated in Alt. 3) and 2-30 would not be visable from the brook due to the high sloping terrain immediately adjacent to the brook. For those areas proposed for uneven-aged management that are visable, the single tree and group selection treatments would reduce stand density, while maintaining a natural-looking forested landscape.

Applying Forest Plan standards and guidelines as well as design features (Section 2.5) would minimize visual impacts along FR 11 and from high elevation viewpoints (USDA Forest Service 2005d).

Cumulative Effects

See Map 6 and Section 3.1 for location and projects considered in the following cumulative effects analysis.

The Analysis Area for cumulative effects on scenic resources is the same as for direct and indirect effects, with the addition of adjacent private lands that may be viewed from the same viewpoints. This area was selected because allows consideration of how the national forest lands contrast with or complement the adjoining private lands as viewed from set viewpoints.

The temporal scope for cumulative effects on scenic resources is the same as for direct and indirect effects. This allows consideration of the additive effect of foreseeable activities on the scenic resource.

Alternative 1

Evidence of previous harvesting is visible across the landscape on national forest and private ownership. The scenic environment includes past activity such as natural disturbances, timber management, landing clearing for residential housing development, and road construction. Even-aged harvest units of the West Branch Timber Sale of 2000 are densely populated with young hardwoods, differing in height and color than the surrounding vegetation. Over the next several years the inholding parcel will regenerate in a similar manner.

Alternative 2 and 3

Similar to Alternative 1, both of the action alternatives propose some level of clearcutting that would meet the Forest Plan standards and guidelines for visual quality for all viewpoints. Alternative 2 produces the greatest amount of visible openings upon the

landscape as seen from viewpoints (16.3 aces) compared to Alternative 3 (12.3 acres). These additional openings create a greater diversity of textures and visual impact across the analysis area. Additional harvesting on private land may occur in the next 20 years, but cumulative impacts to scenic resources are expected to be well within Forest Plan thresholds for individual viewpoints and allowable observed openings (see Scenic Resources Report in the project file). The cumulative visual effects would be a blend of new openings and areas of differing height and coloration, producing a mosaic effect of textures upon the landscape.

3.9 Socio-economic Assessment

The following analysis summarizes the information contained in the project file, which includes supporting data, calculations, and other information used in this analysis.

Affected Environment

The Final Environmental Impact Statement for the Forest Plan details the social environment of the White Mountain National Forest in terms of populations, demographics, partnerships, values, uses of the Forest, and attitudes toward land management (USDA Forest Service 2005b pp. 3-472 to 3-486). While many of the communities surrounding the national forest share a history of reliance on natural resources and tourism for their livelihoods, it is recognized that social and economic patterns are now changing, with marked differences in the south and north. Populations and the economy are growing in the communities surrounding the southern portions of the Forest. Meanwhile, communities in the north have slower economic growth, some decline in populations, and a greater dependence on traditional natural resource-based manufacturing industries.

The project area is located in the Town of Stark, Coos County, at the northern-most tip of the White Mountain National Forest. Stark was incorporated in 1795 and covers about 59 square miles of land, with 49% in National Forest System lands. The population has declined from a high of 516 in 1990 to a reported 498 residents in the 2006 census. Most (91%) of employed residents work elsewhere, commuting to jobs in other towns or states (Economic and Labor Market Information Bureau, NH Employment Security 2007).

While recreation use is relatively low when compared to other parts of the National Forest, local residents value the Mill Brook and South Pond areas for hiking, fishing, snowmobiling, and other recreational pursuits. Recreation values and uses are described in the Recreation, Section 3.7.

The White Mountain National Forest recognizes the Forest's support to local and regional economies and strives "to provide both healthy ecosystems and a sustainable yield of high quality forest products, with special emphasis on sawtimber and veneer" (USDA Forest Service 2005a, pp. 1-3 and 1-17). Forest product manufacturers are within viable hauling distance to the project area, and it is reasonable to assume that products from the Mill Brook timber harvest will supply some of these businesses. Forest products for local markets are also available from industrial timberlands, private land, and state and town forests.

There is a demand for national forest timber products, with average bid prices similar to or higher than those received on private land. The Forest's high value sawtimber, especially, represents a key niche in the region, and has impacts on the local economy (USDA Forest Service 2005b p. 3-498).

Planning costs for the Mill Brook project include planning and analysis as documented in this EA – field surveys and examinations, literature reviews, surveys, public involvement, and preparation of documents. If the decision is made to move forward with either Alternative 2 or 3, additional costs would be incurred for timber sale preparation; contract preparation, appraisal, and sale; contract administration; personnel time for preparing and implementing the mowing, stumping, or prescribed fire activities for wildlife opening maintenance and watershed restoration.

Stark Village church and covered bridge depict the rural character and quality of life valued in communities around the White Mountain National Forest.

Funding options for some of the proposed work includes money authorized by Stewardship Contracting or Knutson-Vandenberg (KV) laws, which allows the retention and use of timber receipts to accomplish restoration and improvement projects in and near the project area. For the Mill Brook project, the watershed projects and the wildlife opening maintenance would be considered for that funding.

Reimbursements to communities in which national forest timber is harvested are:

- New Hampshire Statute [Chapter 79 (Forest Conservation and Taxation), RSA, Section 79:3, Normal Yield Tax] directs what is known as the "Timber Yield Tax." Section 79.3 describes the tax as "[a] normal yield tax at the rate of 10 percent on the stumpage value at the time of cutting." The Towns assess and collect the 10% yield tax from timber purchasers harvesting on private and public lands each year.
- Under the 25 Percent Payment-to-States Fund (25% Fund), New Hampshire collects 25% of the annual revenue generated in the White Mountain National Forest from timber harvest and other revenue-producing activities. The State then disburses the funds to New Hampshire towns that have national forest acreage, to be used for the benefit of public schools.

Measuring Socio-Economic Effects

On a project level, examination of social and economic effects is required if they are important to a reasoned decision. Also required is the consideration of effects to particular natural resources, low income and minority populations, as well as unquantifiable environmental amenities and values relevant to the proposed actions (FSH 1909.15 Section 15). Although social and economic factors are not a significant issue in the Mill Brook analysis and not a component of the purpose and need for the project, comments and questions regarding social and economic effects were raised in the scoping period and, where the comments are relevant to the project, are responded to in this section and in Appendices B and C.

Social impacts analyzed in the Forest Plan were in the context of what people value about the Forest, and the effects of national forest management on the quality of life and rural character of the Forest Region. Effects were based primarily on assessments of trends across the four counties in which the WMNF is located (USDA Forest Service

2005b p.3-487); however, these elements and others can be measured at the project level as follows:

- Rural character may be measured by changes in human activity because of changes in development levels and access. For the Mill Brook project, there are no changes in development levels proposed, but changes in human activity and access are expected.
- Quality of life may be measured by the changes in safe drinking water, recreational opportunities, healthy ecosystems, scenic beauty, and the natural and cultural heritage of the area.
- Public health and safety is an important social element when proposing timber harvest and other activities using large equipment and public travel ways, and may be measured by changes in traffic patterns.
- Environmental Justice may be measured, as required by Executive Order 12898, by analyzing the potential for minority and low-income populations to be disproportionately affected by the proposed activities.

Economic elements analyzed in the FEIS included regional employment and labor income as affected by an array of factors such as timber harvest, road construction and maintenance, recreation management and trends, state and local government activities, and the structure of the forest products industry (USDA Forest Service 2005b p. 3-509). Relevant, measurable economic elements at the project level are:

- Costs and revenues of planning and implementing the proposed activities.
- Timber tax payment to the Town of Stark.
- 25% Fund reimbursements to the State of New Hampshire.

The Forest Service is not required to select the alternative with the highest timber volume or revenue. Many social and economic effects are not tangible and cannot be quantified, and are recognized as either beneficial or not, depending on one's values and perspectives. For example, clearcuts may have adverse visual effects to some, but may be viewed as valuable wildlife habitat by others. Overall, the Forest Service strives to preserve and enhance natural resources for the benefit and enjoyment of the Forest as part of its mission in serving the public.

The Mill Brook proposals that could have a measurable effect on socio-economics are timber harvest, seasons of operation, road restoration and reclassifications, wildlife opening maintenance, and watershed restoration.

Direct and Indirect Effects

The analysis area for direct and indirect effects on socio-economics is the Town of Stark because all of the proposed activities would occur in Stark. In addition, because about one-half of the Town is in national forest ownership, it would be most affected socially and economically by the proposed activities. The Town of Stark encompasses 37,760 acres; 19,163 acres are in national forest ownership.

The temporal scope for direct and indirect effects is the duration of the project activities because any direct or indirect effects would occur during or soon after operations.

Table 5. Estimated Timber Economic Characterisitcs by Alternative

	Alt 1	Alt 2	Alt 3
Estimated Costs:			
Environmental Analysis and Project Planning	$155,100	$155,100	$155,100
Timber Sale Preparation	$0	$72,111	$50,529
Timber Sale Administration	$0	$35,336	$24,521
ESTIMATED TIMBER HARVEST TOTAL COSTS	**—**	**$268, 187**	**$234,350**
Estimated Revenues:			
Estimated Harvest Volume (MBF)	0	3,520	2,480
Estimated Net Stumpage Receipts* (volume X avg. $/MBF)	$0	$655,520	$447,080
Estimated 25% Fund Payment to NH	$0	$163,880	$111,770
Estimated 10% Timber Yield Tax to Stark	$0	$65,552	$44,708
Estimated Net Value (timber receipts – timber cost)	**—**	**$387,333**	**$212,730**
Estimated Unit Cost (timber cost/MBF)		**$76**	**$95**

NOTE: Costs for Planning, Preparation, and Administration are based on average costs per acre displayed in Table B-11 of the FEIS (USDA Forest Service 2005b p. B-20) and includes costs for regeneration surveys. Alternative 2 proposes 1,034 acres; Alternative 3 proposes 721 acres.

* Includes estimates for road restoration costs.

Table 6. Estimated Costs of Non-Timber Activities

Wildlife Opening Maintenance	**Alt 1**	**Alt 2**		**Alt 3**	
Stumping	$0	10 ac.	$8,000	5 ac.	$4,000
Prescribed Fire	$0	11 ac.	$3,355	5 ac.	$1,525
OR Mechanical (Mow/Brush)	$0	11 ac.	$1,650	5 ac.	$750
Watershed Restoration (2 sites)	$0		$16,000		$16,000

Alternative 1

No revenue would be generated and no reimbursements would come to the State, County, or Town. The cost of project planning and environmental analysis is approximately $155,100 regardless of the alternative selected. There would be no changes in rural character or public health and safety because no activities would be implemented. The recreational component contributing to quality of life would be slightly affected because hunting opportunities that would have been available in newly harvested areas would be foregone.

Alternatives 2 and 3

See Tables 5 and 6 for estimated costs and revenues associated with implementing either Alternative 2 or 3. While Alternative 3 would have lower costs due to fewer acres of harvest to prepare and administer, it also would have lower revenue from the reduced volume harvested.

Direct and indirect effects to quality of life and rural character are expected to be minimal because the proposals mirror traditional activities occurring on private lands in the region and Town. Water and soil resources would be enhanced with road maintenance and watershed restoration while healthy ecosystems would be promoted through timber harvest and creation of diverse habitats (see Sections 3.3, 3.10, 3.11,

3.12, and 3.15 for discussions regarding the effects to resources). Recreation use would be enhanced by increased hunting opportunities for several years after harvest, but access would be temporarily impacted by closure of the Mill Brook snowmobile trail during harvest operations (see Recreation, Section 3.7).

Scenic quality and heritage resources would be protected through the Forest's Scenery Management System and standards and guidelines as described in Sections 3.4 and 3.8.

Human activity would be increased only for the duration of project operations as work crews and Forest Service personnel implement the proposed activities, but not to the level of having a noticable effect on the rural character of the area. No new developments, roads, or trails are proposed, so permananet access would not change. The road decommissioning would not change public access because the road segments proposed for decommissioning are not currently open for public vehicle use.

Direct and indirect effects to public health and safety could result from traffic increases on NH Route 110 and the Mill Brook Road (FR 11). Visitors on FR 11 would notice increased use by trucks, trailers, and large equipment, as would travelers on NH Route 110 near the junction of the Mill Brook Road. These noticeable traffic increases are not without precedence due to the traffic associated with timber harvest on private land in and near the project area over the past 15-20 years.

Cumulative Effects

The analysis area for cumulative effects on socio-economic effects includes the Town of Stark and the Town of Milan because they are adjacent towns, each with national forest ownership, and each with recent, proposed, and/or planned national forest timber harvest activity. Stark has 51% national forest ownership and Milan has 11% national forest ownership.

The temporal scope for cumulative effects on socio-economics is ten years past and ten years into the future (1998-2018). This period was chosen to coincide with the vegetation time frame for cumulative effects, because of all other past, present, and planned projects in the area, timber harvest activity has the greatest potential for social and economic effects.

Alternative 1

Revenue generated cumulatively from national forest timber harvesting and on private lands would continue to contribute to town budgets. The upcoming Pond Brook and Upper Ammonoosuc timber sales will contribute approximately $39,275 to the State from the 25% Payment to States Fund, and about $15,710 from the 10% Timber Yield Tax. There would be no cumulative changes to the existing rural chararacter, quality of life, or public health and safety.

Alternatives 2 and 3

Cumulatively, human activity associated with timber harvest operations on national forest and private lands will continue to be steady and noticable. There have been no permanent developments or permanent changes in access as a result of timber harvests over the last ten years. The last road construction/reconstruction in the project area occurred in the 1980s on FR 199 and FR 200 for the Hickory Brook and Hickey Brook sales, respectively. No new roads are proposed or planned, so no cumulative effects

to the rural character of the Towns are anticipated. Human activity associated with timber harvest may be viewed as a beneficial effect in this area where employment relies somewhat on the forest-products industry.

Forest Plan standards and guidelines, Best Management Practices, and design features are integrated into all past and planned timber harvests to protect soils, water, scenery, and heritage resources, so there would be no cumulative effects to those aspects of the existing quality of life in the Towns. Timber harvest prescriptions are site-specific and designed to promote healthy ecosystems, so no adverse cumulative effects are anticipated as a result of national forest timber harvests.

It is difficult to predict what effect private timber harvests may have on ecosytems within the Towns, although New Hampshire Best Management Practices are assumed to be implemented in order to protect ecosystems. Cumulative effects to recreational opportunites will be minimal and are described in Section 3.7. Cumulative effects to public health and safety – i.e. changes in traffic patterns – will be noticable but not considered a threat because logging traffic on Forest Roads to the Mill Brook project and the planned Pond Brook and Upper Ammonoosuc timber sales is spread out on different Forest Roads over the course of 3-5 years in various seasons. There will be additional logging traffic on NH Route 110 as a result of these harvest operations, however, but is not likely to be noticable except at the road junctions where logging traffic will be turning to leave or enter the project areas.

Assessing the cumulative economic effects for the Mill Brook project includes the past and potential payments from timber receipts, as displayed in Table 7 below. There are no other national forest revenue-producing activities in the cumulative effects area that would contribute to the 25% Payment to States fund. Because timber harvest is anticipated to continue on private lands, the Towns will benenfit economically from the 10% Timber Yield Tax.

The cumulative payments from the 25% Fund and the Timber Yield Tax as a result of Mill Brook and other Forest Service projects in the Towns of Stark and Milan would be:

- Alternative 1: $380,506
- Alternative 2: $609,938
- Alternative 3: $536,984

Because each timber sale is site-specific and different in acreage, timber volume and value, road costs, harvest prescriptions, and the need for regeneration surveys, total costs vary widely. There are no cumulative effects associated with project planning, preparation, and adminstration. Annual expenditures depend on the level of funding allocated from Congress to implement the Forest Plan and carry out the Forest Service mission. There are many resulting non-commodity and unquantifiable benefits associated with the cost of public land management.

Table 7. Potential Payments from WMNF Timber Harvest in Towns of Stark and Milan, 1998-2018

	Stumpage Value	Past/Planned Payments to State or Town	Alt. 1	Alt. 2	Alt. 3
Timber Sales since 1998					
• Stumpage Value	$930,059				
• Potential 25% Fund Payment to New Hampshire		$232,515			
• Potential 10% NH Timber Yield Tax to Stark and Milan		$93,006			
Proposed Mill Brook Timber Sale					
• Stumpage Value			$0	$655,520	$447,080
• Potential 25% Fund Payment to New Hampshire			$0	$163,880	$111,770
• Potential 10% NH Timber Yield Tax Payment to Stark			$0	$65,552	$44,708
Planned Pond Brook and Upper Ammonoosuc Timber Sales					
• Stumpage Value	$157,100				
• Potential 25% Payment Fund to New Hampshire		$39,275			
• Potential 10% NH Timber Yield Tax to Stark and Milan		$15,710			
TOTAL POTENTIAL PAYMENTS (1998-2018)		$380,506	$0	$229,432	$156,478

Environmental Justice

Less than 2% of Coos County is considered to be minority populations, and there are no recorded minority populations in the Towns of Stark and Milan (Economic and Labor Market Information Bureau, NH Employment Security 2007, and Lamontagne, Croteau, pers. comm. 2008). About 2.5% of Stark's population is below the poverty level, as is 3% of Milan's population. Both are well below the state average of 6.5% and the Coos County average of 10% (US Census Bureau). No concerns about these populations were raised during scoping and because they comprise a small percentage of the overall population in the towns, there is little potential for minority and low-income populations to be disproportionately affected by the proposed activities.

3.10 Soils

The following analysis summarizes the information contained in the Soils Specialist Report completed by the Forest Soils Scientist. The Report is located in the project file along with supporting research, data, photos, and other documentation used in this analysis.

Soil Erosion and Compaction

Affected Environment

Soils are described in terms of Ecological Land Types (ELTs), which are based on geomorphic history, soil type, and the natural succession of vegetation the soils would support. ELTs are used by resource specialists to make a variety of decisions such as:

1. Suitability of the site for timber harvest or other activities.
2. Which species are best suited to the site and which harvest methods would best encourage those species.
3. What seasons of operation would best minimize soils effects.

ELTs for the proposed timber harvest stands are described in detail in the Mill Brook Soils Report in the project file in the table titled "Ecological Land Type by Forest Stand." In summary, most of the proposed harvest acres are moderately- to well-drained fine sandy loam corresponding to ELTs 115C and 115g. These are typical soils on suitable timber lands on the White Mountain National Forest. These land types produce northern hardwood forests with mixtures of sugar maple and beech increasing as the stands mature. There are a few small areas of ELT 115a and 2d, which support spruce-fir forests on moderately well-drained fine sandy loams, generally found on lower ground, commonly with surface drainages. Most stands are rated high for potential surface erosion, although as discussed below in the effects sections, potential for erosion is greatly minimized with application of protective measures.

In the early 1900s the project area was a mix of heavily and lightly harvested hardwood and softwood forest (Goodale 2003). Since those early times, timber harvest has been conventional, bole-only harvests, with the residual tops and limbs retaining about 35% of the calcium on-site. Field examinations indicate that all stands previously harvested to regenerate new forest have met agency requirements for adequate stocking at three and five years after harvest. 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.

Roads, landings, and skid trails are potential sources of soil erosion because they may expose mineral soil (Patric 1976). Field visits to the project area show that roads have been maintained to Forest Service standards to prevent concentration of water on the road surface, and hence erosion is not evident. With the exception of the road segments associated with the watershed restoration projects (Old Road and FR 2204), previously-used temporary roads and landings have stabilized, and several are revegetated. Little soil erosion from the last harvest activity in 1990s is evident. Waterbars are in place on skid trails and there is no evidence of accelerated soil erosion (Colter 2006).

Timber harvest operations are a potential source of soil compaction and are a concern because it can have an effect on forest productivity by inhibiting germination and root growth. Shovel tests on existing main skid trails in the Mill Brook area revealed no residual effects of compaction from harvesting activity in the Hickey Brook and West Branch timber sales of the late 1990s, the last time some of these trails were used (Colter 2006). Existing log landings are well located and stabilized, and field inspection found minimal effects from soil compaction as a result of the last harvest activity in 1990s (Colter 2006).

Measuring Effects to Soils

The soils analysis uses the best available science, monitoring, field work, and data on which to base the effects of this project. Supporting documents and research reports are in the project file. The Mill Brook Soils Report in the project file includes summaries of the FEIS analysis, relevant research regarding soils, and data and supporting documentation for the following effects analyses. This analysis is grounded in field studies and surveys completed in the project area.

The relevant soil elements for the Mill Brook timber harvest and other proposed activities are soil erosion, soil compaction, and soil productivity. Forest Service Soil Quality Standards (USDA Forest Service Handbook, Supplement R9RO 2509.18-2005-1) provide thresholds for soil characteristics that are used as indicators of detrimental soil disturbance.

Soil erosion and compaction are considered detrimental if 15% of the soils in the project area are disturbed during the cumulative effects analysis period. Soil productivity is measured differently as discussed below.

The Mill Brook proposals that could have a measurable effect on soil erosion, compaction, or productivity are: timber harvest (operating season, nutrient removal); road and landing work; skid trails; wildlife opening maintenance; and watershed restoration. Road classifications have no measurable effects on soils. Road decommissioning would restore soil productivity and have measurable effect on soils.

Direct and Indirect Effects

The analysis area for direct and indirect effects on soil erosion and compaction is the stands proposed for treatment because that is where any effects should not extend beyond those stands. The time period studied for direct and indirect effects is the length of the timber operation because that is the amount of time soil disturbing activities will take place.

Analyzing soil responses to past similar actions is useful in determining direct and indirect effects associated with the proposed activities. As noted above, there is little evidence of erosion or compaction from timber harvest activities in the project area in the last 15 years. Research and monitoring has shown that the application of Best Management Practices (BMPs) and other soil conservation practices are effective in minimizing soils effects. The Mill Brook Soils Report in the project file has summaries of the FEIS analysis, relevant research regarding the effective use of BMPs on similar soils in Maine, and the results of bulk density studies that show recovery from logging operations occurs within three years after completion.

Alternative 1

In the absence of timber harvest and road work, no effects in surface soil erosion or soil compaction are expected. Skid trails, roads, and landings would not be restored and used, but ongoing routine maintenance would continue in the future. Erosion would continue in the areas proposed for watershed restoration, with direct and indirect effects as described in Water Resources (Section 3.12).

Alternatives 2 and 3

Although road work may initially cause ground disturbance, maintaining roads ultimately serves to prevent erosion (NCASI 2000, Moll et al. 1997) by keeping drainage structures operational and repairing minor problems before they become washouts. After harvest, road closure techniques have proven effective in preventing soil erosion (University of New Hampshire 2004, Maine Department of Conservation 2002 and 2006, Stafford et al. 1996). The minor scope of the work and the use of protective measures (BMPs, Forest Plan standards and guidelines, and project design features) would result in minimal direct or indirect effects on soil erosion or compaction.

The Old Road watershed restoration project would restore the floodplain and dissipate energy, reducing or eliminating channel and road erosion. The channel stabilization project near FR 2204 would dissipate energy and reduce or eliminate erosion along FR 2204. The two watershed projects would help to minimize existing erosion and improve soil productivity so no adverse effects are anticipated from this work. Road decommissioning also helps to improve the watershed and the soils by eliminating compaction and letting the soils grow trees restoring soil productivity.

The project area is moderately sloped, with steep slopes in some locations; however, timber harvest will only occur on slopes less than 35 percent. The lengths of these slopes are short enough to limit potential for notable soil erosion on skid trails and in harvest units. The combination of moderately sloped terrain with application of Forest Plan standards and guidelines and BMPs (such as stabilization and waterbars) should prevent soil erosion and promote revegetation (New Hampshire DES 2004, Maine Department of Conservation 2005 and 2006, Stafford, et al. 1996).

Most units will be harvested only in the winter with frozen soils, resulting in little if any surface soil erosion or soil compaction. Over-snow operations should produce very little compaction, since operations will not have direct contact with mineral soil and any effects from compaction should disappear by the following winter.

Harvesting and skidding on stands during summer or fall will expose mineral soil, particularly on the main skid trails, and it is likely there would be site-specific instances of surface soil erosion and compaction from loss of organic cover. Planned layout and management of skid trails, using breaks in terrain and avoiding steep slopes, and limiting operations to dry conditions would largely minimize or avoid soil erosion. Some temporary compaction will be expected on main skid trails, but this would be minimized and soils should fully recover from any compaction within three years of the end of operations (Donnelly et al. 1991).

In Alternatives 2, seven existing and five new log landings are proposed for use during harvest. For Alternative 3, three existing and five new log landings are proposed. The existing landings are well placed on gentle terrain and well-drained soils, and new landings will be carefully placed to avoid resource damage. Truck traffic and skidder

operation will churn the soil surface and expose mineral soil leading to on-site soil erosion in the boundary of the log yard; however, the combination of careful site selection and management of the log yard during use would limit the extent of erosion and prevent long-term soil erosion impacts. When operations are complete, the log landings would be graded and stabilized to prevent erosion and to accelerate recovery from temporary soil compaction (USDA FSH 2509.22, Section 6.38).

The additional acres of permanent wildlife openings are well placed on gentle terrain and well-drained soils. Stumping will churn the soil surface and expose mineral soil leading to on-site soil erosion, however, careful site selection and operating when soils are dry would limit the extent of erosion and compaction and prevent long-term soil erosion impacts. Continued maintenance by burning, mowing, or hand-brushing will cause no soils effects because ground cover will remain. Monitoring shows that prescribed fires on the White Mountain National Forest do not get hot enough to burn off the surface organic material.

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.

A measure of erosion or compaction effects is the rate and success of revegetation on disturbed areas. Restocking surveys and field reviews on the White Mountain National Forest reveal that skid trails and log landings are revegetating rapidly and naturally, as would be expected with documented recovery rates of 2-3 years (Donnelly et al. 1991; Holman et al. 1978). Similar recovery is expected from Mill Brook operations.

Cumulative Effects

See Map 4 and Section 3.1 for location and projects considered in the following cumulative effects analysis.

The analysis area for cumulative effects on soil erosion and compaction is the Mill Brook and Pond Brook watersheds. The total acreage of the watersheds is approximately 15,820 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 use and potential use on national forest and private lands relative to the proposed project.

The temporal scope for cumulative effects on soil erosion and compaction is fifteen years in the past and ten years beyond the Proposed Action and its alternative. This period was chosen to incorporate the last timber harvesting operations on national forest lands in the analysis area (the Hickey Brook and West Branch Timber Sales of the late 1990s), 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.

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 land unit scale area over the cumulative effects time period (USDA Forest Service Handbook, Supplement R9RO 2509.18-2005-1, Section 2.2). Table 9 in Section 3.12 (Water Resources) displays the ground disturbance by alternative.

Planned future timber harvest in the cumulative effects area includes the Pond Brook timber sale (see Section 3.1). No additional national forest timber harvest is in the cumulative effects analysis area over the next ten years, and no other projects are anticipated in this area during this time frame that would use the skid trails or landings. The Forest Roads, recreation trails and permanent wildlife openings in the cumulative effects analysis area will continue to be maintained and used for public and administrative access. Activities planned on private inholdings are unknown, although there is a possibility that 200 acres of shelterwood harvest could occur on private lands in the next 10 years. Assuming New Hampshire Best Management Practices are employed on private land, there would not be any measurable soils effects from any other past, present and future projects that may occur in the analysis area.

Alternative 1

There will continue to be localized erosion related to ongoing maintenance of Forest Roads, recreation trails and private roads and timber harvest on private lands. Without the watershed restoration projects, erosion and sedimentation would continue along the Old Road and near FR 2204. There would be no activities implemented to add incremental effects so there will be no cumulative effects under this alternative.

Alternatives 2 and 3

Although repeated activity in an area can increase compaction, shovel tests in areas harvested in the late 1990s revealed little or no evidence of compaction, indicating that the soil has effectively recovered. Use of 2005 Forest Plan standards and guidelines and BMPs would minimize the hazard and duration of effects due to soil erosion and compaction resulting from the Mill Brook and Pond Brook timber harvests (USDA Forest Service 2005b p 3-29, New Hampshire 2004, Maine Department of Conservation 2005 and 2006, Stafford, et al. 1996). Some of the existing skid trails and landings, where the soil has already demonstrated the ability to recover quickly from harvesting, will be used again. Rapid recovery is likely a combination of location, soil type, and post-harvest site rehabilitation.

Use of BMPs during timber harvest on private inholdings is expected to limit areas of soil disturbance and soil erosion and compaction.

The effects of soil erosion are often of greatest concern in streams and rivers. Refer to Section 3.12 for the predicted cumulative effects on watersheds.

Potential soil erosion is linked to the amount of soil disturbance, which would be increased 3.4% in the short-term on national forest lands each for Alternatives 2 and 3. Considering the potential for ground-disturbing activities on the private inholdings, calculations in the project file show the 15% threshold for ground disturbance would not be reached even if all private acres were disturbed in the next 10 years.

No soil erosion or compaction cumulative effects are predicted because:

- There is little remaining evidence of soils effects from past harvests (field notes in project file).
- Effective soil conservation measures including Best Management Practices, Forest Plan standards and guidelines, and project design features will be applied in this project and future activities.

- The planned activities are 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) (calculations in project file).
- The planned activities are within the scope of effects anticipated and analyzed in the 2005 FEIS (USDA Forest Service 2005b pp 3-29 to 3-36).

Soil Productivity

Affected Environment

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). For the Mill Brook project we focus on biomass accumulation as a measure of soil productivity. This choice of methodology is based on the 2005 FEIS analysis which studied in detail the potential impacts of acid deposition and timber harvest on soil productivity. The analysis focuses on soil calcium and uses research based on watershed studies, experimental watershed acidification, and retrospective soil analysis. This analysis for the Mill Brook proposal incorporates by reference the soil productivity analysis in the FEIS (USDA Forest Service 2005b pp 3-7 to 3-28). A summary of key points follows.

1. Estimated loss of soil calcium raises concerns about possible changes in forest health (dieback or decline), productivity, and forest species composition. (USDA Forest Service 2005b p. 3-7).
2. Factors affecting soil nutrients (including calcium) and long-term soil productivity include:
   - 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 (USDA Forest Service 2005b p 3-10).
   - 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 (USDA Forest Service 2005b p 3-11).
   - 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 (USDA Forest Service 2005b p 3-11).
   - 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. Research since 1955 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 (USDA Forest Service 2005b pp. 3-11, 3-12).

3. 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 (USDA Forest Service 2005b p. 3-13).
4. 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 impacted (USDA Forest Service 2005b p. 3-15).
5. 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 (USDA Forest Service 2005b p 3-16).

In measuring effects, the FEIS (USDA Forest Service 2005b, pp. 3-17) 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."

The cumulative effects for soil productivity includes consideration of early land use (forestry, agriculture), long-term changes in atmospheric deposition (sulfate, nitrate, particulate matter), and future land uses (USDA Forest Service 2005b p 3-18). The analysis concludes that "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." The FEIS continues "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 (USDA Forest Service 2005b p 3-26, 3-27)."

Direct and Indirect Effects

The analysis area for direct and indirect effects on soil productivity is the stands proposed for treatment because any effects should not extend beyond those stands. The time period studied for direct and indirect effects is the length of the timber operation because that is the amount of time soil disturbing activities will take place.

Alternative 1

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). (USDA Forest Service 2005b 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.

Alternatives 2 and 3

The direct effect of timber harvesting is the removal of calcium that would otherwise be recycled to the forest floor. Clearcut/patch cut prescriptions in the Mill Brook project would remove about 350 Kg/ha of calcium, and the selection harvests (individual tree/group/thinning) remove about 25 percent of this, or 88 Kg/ha. When considering calcium content of woody material with the calcium that resides in the soil, the proposed clearcut/patchcut harvests would remove about 2 percent of the calcium from a site, and the selection harvests would remove up to 1 percent of the calcium (USDA Forest Service 2005b 3-19). Alternative 3 has less direct impact on calcium because it harvests fewer acres overall and fewer clearcut/patchcut acres, while Alternative 2 has a greater potential impact.

The indirect effect of timber harvesting could include changes in available (exchangeable) soil calcium, base saturation, and possible impacts on forest health, tree mortality and decay, productivity, or species composition that are not attributed to acid deposition (USDA Forest Service 2005b p 3-18). Indirect effects on soil calcium are not expected from either Alternative 2 or Alternative 3. This conclusion is based on research at Hubbard Brook Experimental Forest that shows soil exchangeable calcium was not lost due to forest harvest (USDA Forest Service 2005b p 3-20) over the course of 15 years. 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 p 3-13). Also, recent measurements related to forest productivity 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 p 3-13). As concluded in the FEIS, no impact is expected on forest health or productivity related to the timber harvest program, of which Mill Brook is a part, across the forest during the next two decades (USDA Forest Service 2005b p 3-27).

The prescribed burning of the permanent wildlife openings proposed would occur either in spring when the snow cover has melted or in late summer/early fall, when temperatures have cooled. Some surface soil organic matter will be lost due to burning, and although soil calcium would not be reduced by burning, it can be removed from a site by erosion. Some soil nitrogen would be lost when the organic matter burns, but nitrogen is not considered to be a limiting factor in tree growth on the White Mountain National Forest.

With respect to indirect impacts, 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 pp 3-20 to 3-27).

Cumulative Effects

The analysis area for direct and indirect effects on soil productivity is the stands proposed for treatment because any effects should not extend beyond those stands.

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). With this timeframe, the percent of total loss discussed below takes into account calcium depletion for the last 57 years, foreseeable calcium depletion for the next 10 years, previous harvests, and current harvest proposed.

Alternative 1

Early timber harvest is estimated to have removed <1 percent of the calcium per acre of harvest. Atmospheric deposition also removes soil calcium estimated at 4 percent over 120 years. (USDA Forest Service 2005b p 3-24). Given that the cumulative effects time period goes back 57 years, it is possible that atmospheric deposition may have removed up to 3 percent of the total soil calcium during that time. Adding this to the potential loss from past timber harvest, estimated 4 percent soil calcium may have been lost over 120 years (USDA Forest Service 2005b p 3-24).

Atmospheric deposition may continue to deplete soil calcium though evidence it appears that soil and streams are recovering from the possible impacts of acid deposition (USDA Forest Service 2005b p 3-26). Field investigation of the Mill Brook project area has not revealed any unusual dieback or mortality that would indicate effects from atmospheric deposition. Stands previously harvested in this vicinity have adequately regenerated and no change in biomass accumulation is evident in the project area or has been documented at the nearby Bartlett Experimental Forest. Thus, it does not appear there are issues with soil productivity.

Alternatives 2 and 3

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 2 would remove the most calcium because it proposes 56 acres of clearcut/patchcuts, bole-only harvest, and 978 of the remaining planned bole-only harvest acres: groups, improvement cuts, individual tree selection, and overstory removal. Alternative 3 proposes to remove the least amount of calcium because it proposes 51 acres of clearcut/patchcut bole-only harvest, and 670 of the remaining planned bole-only harvest acres: groups, improvement cuts, individual tree selection, and overstory removal. However, 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 on 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 pp 3-23 to 3-25). By applying Forest Plan Standards and Guidelines and tiering to the FEIS and using best available science, no adverse effects on soil productivity are anticipated with any of the action alternatives.

3.11 Vegetation —Timber Resources

During Forest Plan Revision, best available science was used to develop goals, objectives, standards, and guidelines for vegetation management on the White Mountain National Forest. The analysis used to evaluate effects to vegetation for this project incorporates by reference information from the FEIS (USDA Forest Service 2005b Chapter 3, pp 3-73 through 3-164), as well as literature cited in this report.

The following analysis summarizes the information contained in the project file along with supporting research, data, photos, and other documentation used in this analysis.

Affected Environment

Many of the proposed harvests are in overstocked mature stands of northern hardwoods, softwoods or mixedwoods. Ice damage sustained in 1998 is evident in aspen, beech, paper birch, and yellow birch throughout the Mill Brook HMU, resulting in low timber quality of dead and dying trees. Losses are particularly heavy for paper birch in stands at higher elevations. According to the *Silvicultural Guide for Northern Hardwood Types in the Northeast* (Leak et al. 1987) and *Silvicultural Guide for Paper Birch in the Northeast* (revised) (Safford 1983), harvesting trees and controlling stocking in these stands would improve the quality and vigor of remaining trees. Table 8 describes existing stand conditions.

Tree mortality due to insect and disease is minimal in the Mill Brook HMU. Stand exams and reconnaissance identified borer damage to sugar maple and paper and yellow birch is occasional while the majority of the beech in all of the proposed stands suffers from beech bark disease. These conditions affect tree growth and quality.

The project area has been actively managed for wood products for over 100 years due to its capability to regenerate and produce crop trees. Logging has played an important role in the White Mountains since the 19th century and present vegetative conditions are largely the result of historical logging practices, more recent forest management, and damage from 1998's ice storm. There is no documentation or evidence that the project area was or is considered prime farmland, although some of the more level areas near the Upper Ammonoosuc River were once managed for grazing of livestock. Some of these same areas are still maintained as hayfields.

Historically, "seasons of operation" were defined by dates established by seasonal weather patterns and/or resource or silvicultural requirements. For example, fall and winter operations are required when dry or frozen ground conditions are necessary to protect soil and water resources, or in partial cuts where frozen conditions are necessary to minimize bark damage on residual trees (trees are more susceptible to bark damage in summer). Summer and fall are assigned when operations on bare ground are required to create a seedbed necessary to establish regeneration of particular tree species, or where harvest prescriptions would remove all trees from a site, such as clearcuts and patch cuts (there are few residual trees so there is low potential for bark damage), and where soils can support equipment without adverse effects.

Rather than restricting operations to specific dates as with past projects, operations would be allowed when site conditions are considered normal for the season, i.e. winter harvest would require frozen ground; fall and summer would require dry ground. Harvesting operations would be permitted when site conditions allow, and would

Table 8. Existing Conditions for Stands Identified for Vegetative Treatment

Stand	Habitat Type	Species Mix	Acres	Comment
Compartment 2				
2-10	Northern Hardwood	Sugar and Red Maple, Yellow Birch	29	Some ice damage at upper elevations
2-12	Northern Hardwood	Beech, Sugar Maple, Yellow Birch with scattered spruce/fir	32	Previously thinned northern hardwoods
2-16	Northern Hardwood	Beech, Sugar Maple, Yellow Birch	83	Quality crop trees
2-19	Northern Hardwood	Sugar Maple, Spruce/Fir, Yellow Birch	25	Quality crop trees
2-24	Spruce/fir	Red Spruce, Balsam Fir, White Pine	32	Mature softwoods
2-29a	Northern Hardwood	Beech, Red Maple	4	High ground adjacent to existing Permanent Wildlife Opening
2-30	Northern Hardwood	Balsam Fir, Beech, Hemlock, Sugar Maple, Yellow Birch	56	Mature hardwood on moderate to steeply sloping terrain.
2-34b	Northern Hardwood	Aspen, Beech, Red Maple, Paper Birch, Yellow Birch	29	Mature high-risk trees; ice storm damage.
2-34d	Northern Hardwood	Sugar Maple, Yellow Birch	113	Poletimber/small sawtimber
2-34e	Northern Hardwood	Beech, Sugar Maple, Yellow Birch, Red Maple Spruce-Fir	204	Patchy growth of varying density
2-35a	Northern Hardwood	Beech, Yellow Birch	18	Low quality mature hardwoods
2-35b	Northern Hardwood	Paper Birch, Red Spruce, Yellow Birch	81	Declining quality hardwoods with sugar maple regeneration
2-45	Northern Hardwood	Beech, Sugar Maple, Paper Birch, White Ash	84	Mature northern hardwoods
2-59	Northern Hardwood	Beech, Red and Sugar Maple, Paper and Yellow Birch	79	Poletimber/small sawtimber
2-63	Northern Hardwood	Sugar Maple, Yellow Birch	21	Low quality hardwoods and ice damage
Compartment 3				
3-13a	Northern Hardwood	Spruce/Fir, Paper Birch, Red Maple	5	High ground adjacent to existing Permanent Wildlife Opening
3-16a	Spruce/Fir	Spruce/Fir, Paper Birch, Red Maple	5	Dense softwood understory
3-31	Mixedwood	Red Spruce, Sugar and Red Maple, Paper and Yellow Birch,	40	Poletimber/small sawtimber
3-36	Northern Hardwood	Beech, Red Maple, Yellow Birch	47	Ice damaged Yellow Birch
Compartment 4				
4-15	Northern Hardwood	Beech, Paper and Yellow Birch, Red and Sugar Maple Red Spruce	29	Release softwood regeneration
4-34	Northern Hardwood	Beech, Sugar Maple, Yellow Birch,	18	Favor Yellow Birch, reserve softwoods

be shut down if conditions are unsuitable. Dates of operating restrictions required to protect nesting wildlife would remain firm. As in the past, harvesting operations will be overseen by the Timber Sale Administrator who has the authority to cease operations at any time to protect resources.

Measuring Effects to Timber Resources

The relevant timber element for the Mill Brook project is forest health and productivity.

Forest health and productivity refers to the mix of stand conditions such as age, density, diversity, and land suitability that contribute to the stand's susceptibility to damage and disease and its ability to thrive with optimum growth. Measuring effects to forest health and productivity is a qualitative prediction based on the typical vegetative responses of various silvicultural treatments, other proposed activities, or natural forces, as described below.

Road classification/decommissioning would have no measurable effects on timber resources in the analysis timeframe because any decommissioned roads would be returned to forest productivity further in the future.

Field Reviews

A change from the proposed action as presented in the February 2008 Preliminary EA is an increase in the overall estimated timber volume (MBF). Based on recent information collected from stands in the sale preparation phase of the project, initial estimates have proven to be conservative for timber in the Mill Brook region. Initial volume estimation depends on a number of variables including tree size, condition, site-related factors, experience of the timber cruiser, and his/her familiarity with all the above factors. Initial estimates which are used in the analysis phase of a timber harvest proposal are made during the stand exam process through a series of measurements which are then used to estimate the volume to be removed from a given stand of timber. The measurements made at this stage are usually limited to ranges of tree diameters and basal areas.

In comparison, as field work continues and initial sale plans are made, tree diameters are recorded to the tenth inch and heights to the foot determined for each tree that is identified for harvest. These refined volumes to be sold as part of a timber sale are still considered estimates, and prospective bidders are further encouraged to determine their own volumes.

Additional increases in volume estimates for this project are likely due to a recent update to Forest Service timber specifications which more closely reflect those of the sawtimber and pulpwood industry. An overall increase in utilization will occur as trees or part of trees that were formerly considered unusable will now be captured as marketable pulpwood. For example, excessive sweep in a tree was cause for that tree to be considered cull under the present Forest Service timber specifications, even though industry would accept that tree as merchantable product.

The updated volumes are 3,520 MBF for Alternative 2 and 2,480 MBF for Alternative 3. The project record includes original and updated volumes by stand where we have completed advanced field work.

Updated timber volumes have been applied in the Final EA. Volume changes are reflected in the following sections:

- 2.2 Alternative 2: Proposed Action
- 2.4 Comparison of Alternatives
- 3.4 Heritage Resources
- 3.9 Socio-economic Assessment
- 3.11 Vegetation-Timber Resources

It should be noted that the increase in volume is not a result of any changes in silvicultural prescriptions or acreage. Ongoing field reviews and monitoring checks have confirmed the analysis presented here (see project record for field review data). Further, routine activity reviews of timber sales after they have been completed on the Androscoggin Ranger District are used to provide post-harvest information on sale preparation practices and provide insights into the quality of our implementation and where we can make improvements, if necessary.

Direct and Indirect Effects

The Analysis Area for direct and indirect effects on timber resources is MA 2.1 lands in Compartments 2, 3 and 4 of the Mill Brook HMU. This area has national forest boundary to the north, and the ridgelines formed by Mill Mountain to the east, Roger's Ledge to the southeast, and the Pilot Range to the west. The Analysis Area encompasses 6,270 national forest acres, of which approximately 86% are closed-canopy forest of mature age class with even-aged and uneven-aged stands. The amount of closed and open canopy helps to describe the structural diversity in the analysis area. This area was chosen because these lands are suitable for timber harvest and any noticeable direct and indirect effects on timber resources will be in and near the harvested stands.

The temporal scope for direct and indirect effects on timber resources is up to two years after the proposed activities occur on the ground. This time period was chosen because it represents the length of time for regeneration to become established in the understory.

Alternative 1

Under the No Action Alternative, all stands would continue to grow and mature, however the opportunity to enhance growth, yield, and forest health would be foregone and no forest products would be available to local markets. Some trees would die from natural forces related to size, competition, ice damage, or age stress. Other similar or more shade-tolerant individuals would replace these trees. Over a period of decades, the stands would begin to resemble a climax vegetation type. There would be a species shift from stands that may contain paper birch, red maple, white pine, ash, and aspen, to stands dominated by beech, sugar maple, yellow birch, and spruce/fir. Natural disturbances such as wind, rain and ice events could influence the succession by temporarily providing forest openings that would encourage establishment of less, shade-tolerant species.

Older trees would die out and the remaining, healthy trees would grow larger. As shorter-lived species (aspen, balsam fir, paper birch) grow older they will become more susceptible to natural mortality, ice damage, wind throw, and forest pests. Susceptibility to natural forces over time results in tree mortality that may occur in small pockets or over larger areas. Overall, stand vigor may decline because the opportunity to reduce competition among trees would be foregone.

Harvest prescriptions that would increase growth rates on selected quality sawtimber trees would not be implemented. The Forest Plan goal of providing high quality sawtimber and other timber products on a sustained yield basis would not be met.

Alternative 2

Individual tree and group selection harvests would release or regenerate hardwood and softwood species by removing older and/or lower quality trees. In some areas of abundant understory beech, group selection will promote a mix of faster-growing hardwood species including paper birch, yellow birch, aspen, and white ash. These treatments would maintain an uneven-aged stand leading to greater diversity of age classes and species. Species diversity will be enhanced by retaining any advance regeneration, particularly spruce and fir in the mixed hardwood/softwood stands.

Individual tree selection would remove trees lower in quality, damaged, or diseased trees and would focus growth on the remaining healthy trees. For example, trees damaged by sugar maple borer would be removed healthy trees would be left to propagate healthier sugar maple populations in the future. Overall, individual tree selection improves the health and vigor of the residual stand, increasing growth rates on selected quality sawtimber trees.

Clearcuts are proposed in areas of low quality and/or mature trees to allow the next generation of trees the opportunity to grow at their full potential. Clearcut treatments would promote a mix of trees that do well in sunlight such as aspen, yellow birch, and paper birch. Stands 2-35a and 2-34b (proposed for clearcutting) are generally of poor quality, suffering from ice damage and declining growth rates due to stand maturity. The time is right to harvest these stands to provide regeneration forest habitat while salvaging timber value and promoting the regeneration of vigorous, fast growing trees that can effectively use the site.

A direct effect of clearcutting in northern hardwood stands is the promotion of stump sprouts in species such as aspen and red maple. According to a study on four sites in New England, *Whole-tree Clearcutting in New England: Manager's Guide to Impacts on Soils, Streams, and Regeneration* (Pierce et al. 1993), stump sprouting and germination of new seedlings began in the first growing season after harvest. Young, dense stands were established on all four sites within five years after cutting, a result that mirrors White Mountain National Forest stocking surveys conducted three years after harvest. Clearcutting is the optimal method to regenerate these low quality northern hardwood stands.

The **improvement cuts** in Stands 2-16, 2-34d, and 3-31 would reduce the basal area by approximately 1/3 through the removal of dying and defective trees, undesirable species, and/or trees crowding high-value stems. Direct results of improvement cuts include increased vigor and quality on good sites when a residual basal area of 70 to 80 ft^2/acre is attained (Leak et al. 1987).

The **overstory removal** proposed for Stand 3-16a would harvest the mature trees in the stand while protecting and releasing the established spruce-fir regeneration that is 3′-8′ tall.

Creating a new **permanent wildlife opening** (Stand 3-13a) and expanding the existing wildlife opening (Stand 2-29a) would convert nine acres of tree production to a shrubby, herbaceous condition. Regular maintenance of these sites will discourage growth of woody vegetation and favor herbaceous plant species such as goldenrod and raspberries. The direct and indirect effects of removing this land from timber production would be the lack of opportunity to produce forest products, including quality sawlogs. There would be no diversity of tree species on these sites as long as they are maintained as wildlife openings.

Season of operation can affect forest health and productivity. Summer harvesting can damage bark on residual trees (bark is more vulnerable to damage in summer) so generally stands proposed for clearcuts and patchcuts that remove all or most of the trees from a site are harvested in the summer. Summer harvest scarifies the ground, creating seedbeds for species that require disturbed areas for germination. Many plants have adapted to survive in clearcuts or can quickly re-colonize these areas a short time afterwards (Whitman and Hagan 2000). There would be some species of plants that cannot tolerate direct sunlight and would die, however these would be replaced by species that are prefer direct sunlight.

Harvesting in snow-free times may damage portions of the understory due to repeated passes of logging equipment, while harvesting over a snow pack minimizes the damage.

Additional indirect effects to treated and adjacent stands on forest health and productivity may include increased health and vigor, yet there is a potential for windthrow in the partially cut stands such as those with single-tree-selection, improvement cuts, and group selection prescriptions. Stands adjacent to patchcuts and clearcuts may have increased windthrow until crowns expand to fill the canopy and the roots become windfirm. In looking at these effects on adjacent private lands, Stands 2-45, 2-59, 2-35a, 2-63, 3-36, 2-16, 2-19, and 2-34e are adjacent to private lands that have young trees, with no potential for windthrow or other tree damage as a result of Forest Service activities. Stands 2-45, and 2-30 are adjacent to private lands with a forested canopy, and would be subject to the potential for windthrow as stated above.

Some residual tree damage would occur from harvesting operations, but skid trails are planned adjacent to trees marked for removal in order to provide adequate working space for logging equipment without damage to residual trees.

By removing low quality trees, future harvesting in these stands should lead to a higher percentage of quality sawlogs.

Connected Actions and other Proposed Activities

Road maintenance activities would most likely result in the occasional removal or trimming of vegetation in some areas to accommodate equipment. The approach to FR 11 from the Old Road would require removal of some trees to improve logging truck access, sight distance and public safety. Trees would only be removed immediately adjacent to roads, so stand health and productivity would not be notably affected.

The watershed restoration projects would remove scattered, mature trees within 75 feet of the streams. This would be similar to an individual tree harvest and the area would be maintained as mature forest while promoting age class diversity. The additional sunlight would encourage regeneration and promote a multi-age riparian zone. As mature trees die, younger trees will take their place and provide future channel stability.

Alternative 3

The direct and indirect effects would be similar to Alternative 2 but would occur on fewer acres because less timber harvest is proposed.

Cumulative Effects

See Map 7 and Section 3.1 for location and projects considered in the following cumulative effects analysis.

The Analysis Area for cumulative effects on vegetation encompasses approximately 76,000 acres:

- national forest lands in the Mill Brook and South Pond HMUs (total 33,000 acres);
- private inholdings in both HMUs (total 1,600 acres); and
- adjacent private land in the Towns of Stark and Northumberland (outside of the national forest boundary: total 41,000 acres).

This area was chosen because it includes the proposed action (in the Mill Brook HMU); planned timber harvest in the adjacent South Pond HMU, and past and planned timber harvest on adjacent private land.

The temporal scope for cumulative effects on timber resources is ten years in the past and ten years in the future (1998 to 2018). Ten years is important in tracking effects because it is the length of time after an even-aged harvest (such as a clearcut) that the stand is considered to be in the regeneration forest age class – growing with an open canopy and sunlight reaching the ground.

Map 7 shows the cumulative effects analysis area and the location of past, present, and future projects on Forest Service land and private inholdings.

Alternative 1

The Forest Service may evaluate harvest opportunities in the southern portion of the South Pond HMU. The extent of future harvesting is not yet known and will be determined by future stand exams. Timber harvest on private lands has and will continue to result in temporary changes in age class and distribution.

This alternative will not contribute incrementally to the effects of timber harvest or land clearing over the 20-year period from 1998-2018. Without the proposed timber harvest, species, age class and structural diversity will remain static or diminish. Diversity may be enhanced by natural disturbance such as a weather event, fire, disease or an infestation that can create forest openings and provide some limited opportunities for shade-intolerant plant species. However, on national forest lands, regenerating and young stands will age and grow closer to the surrounding canopy of mature stands. Sunlight to the forest floor will diminish and so will shade-intolerant species. Mature stands of the short-lived (50-60 years) paper birch and aspen community types will continue to age toward mortality, many to be replaced by shade-tolerant species now growing in the understory of these stands.

The cumulative effects would be the same as direct and indirect effects.

Alternatives 2 and 3

The effects of Alternatives 2 and 3 are consistent with those anticipated and analyzed in the FEIS (USDA Forest Service 2005b pp 3-73 to 3-164). Even-aged harvests and the additional acres of permanent wildlife openings would have the effect of reducing the acres in closed-canopy forest and contributing to age class and species diversity in the forested landscape.

Data regarding timber harvests in the cumulative effects area was collected from national forest databases, roadside assessments, town office records, inspection of aerial photos taken every decade from the 1950s to the present. In addition, information was gathered through conversations with landowners, the Society of Protection

of New Hampshire Forests, and Dartmouth College (Sundquist personal communication 2007). As expected, a variety of activities are taking place in the analysis area, including timber harvest in the form of commercial thinnings, clearcuts, group selection, and individual tree selection. Data collected could not fully account for all timber harvest activities in the past ten years and could not predict levels of future harvesting. The following information is known:

Past Harvesting:

- In the past ten years, 356 acres (2%) of national forest lands were harvested in the Mill Brook HMU (17,000 acres); 123 of these acres (1%) were even-aged harvests.
- In the past ten years, 1,133 acres (7%) of national forest lands were harvested in the South Pond HMU (16,000 acres); 156 (1%) of these acres were even-aged harvests.
- In the past ten years, 416 acres (26%) of private inholdings within the two HMUs (1,600 acres) were heavily harvested with either clearcuts or final shelterwood removals.
- From 1996 to 2007, 2,111 acres (3%) were heavily cleared in the Towns of Stark and Northumberland (total area: 62,000 acres). This harvest acreage includes the even-aged harvests for each HMU and the private inholdings listed above. Less intensive harvesting has occurred but is not recorded, so that data is not available.

Future Harvesting:

- In the next ten years, no additional harvesting is expected to occur on national forest lands in the Mill Brook HMU.
- In the next ten years, 1,007 acres (6%) of national forest land will be harvested in the South Pond HMU (16,000 acres) as part of the North Kilkenny project (Pond Brook and Upper Ammonoosuc timber sales); 124 (1%) of these acres will be even-aged harvests.
- In the next ten years, 200 acres (13%) of private inholdings (1,600 acres) may be harvested using a shelterwood prescription. It is unknown what the residual basal area will be after harvest and whether the harvests qualify as a clearcuts according to Forest Service standards. For this analysis, these harvests will be considered even-aged treatments.
- In the next ten years, harvesting is expected to continue in the Towns of Stark and Northumberland. Although types and amounts of harvests cannot be known, it is expected that past harvesting trends will continue.

When considering the past and future harvest in the cumulative effects area, the cumulative effects would be the same as direct and indirect effects. The majority of the northern hardwood and softwood stands are at least 80 to 90 years old and growth is slowing. By harvesting with a variety of treatments now, younger, more rapidly growing trees will be released and therefore the average future growth per acre would increase (USDA Forest Service 2005b). Overall, removing diseased, damaged and low quality trees promotes a healthy, vigorous future forest that increases in value over time due to higher quality residual overstory and understory trees.

3.12 Water Resources

The following analysis summarizes the Water Resource Report completed by the Forest Hydrologist. The Report is located in the project file along with supporting research, data, photos, and other documentation used in this analysis.

Affected Environment

The Mill Brook Vegetative Management Project is located in the Mill Brook watershed (10,220 acres), and the Pond Brook watershed (5,650 acres). These watersheds drain into the Upper Ammonoosuc River near where it turns west on its way to the Connecticut River about 18 miles away near Groveton, NH.

Mill Brook watershed is aligned north to south with the outlet to the north. The highest elevation is 3,920 feet and the lowest is 960 feet, with an average gradient of 9.4 percent. Pond Brook watershed is aligned east to west with the outlet to the east. The highest elevation is 2,780 feet and the lowest is 1,000 feet, with an average gradient of 6.4 percent. Much of the following analysis is based on the sub-watersheds of perennial streams in these larger watersheds

Water Quantity

Water quantity in streams is directly related to the amount of annual precipitation. Research at Hubbard Brook shows that more than half of precipitation becomes streamflow and most of the rest is lost to evapotranspiration (Likens and Bormann 1995).

Removal of vegetation through timber harvest can alter evapotranspiration rates, which in turn can change 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 as reductions in basal area in a watershed approach 25%, a measurable response in annual water yield may be seen in streams (Hornbeck et al. 1993). These increases become greatly reduced 3-4 years after timber harvest, and are 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).

Concerns from Stark citizens prompted a close look at the Old Road, immediately adjacent to Mill Brook in the historic floodplain of Mill Brook. Field investigations revealed erosion of the Old Road caused by the presence of side channels (secondary flood channels) with rock plugs that caused high stream flows to access the Old Road. There is concern that larger floods could cause Mill Brook to cut a new channel down the road. This could redirect flood flows and cause high sediment loads to move downstream, and reduce the capacity of the stream channel to hold water and increasing the potential risk of flood damage to the residents of Stark.

A short segment of road 2204 has been washed out by Mill Brook. Mill Brook is now using approximately 200 feet of the roadbed as a side channel. There is concern that during high flows more of the roadbed could be eroded, causing large sediment inputs to Mill Brook.

Water Quality

The State of New Hampshire designates these reaches as Class B, which is the second highest quality and is considered acceptable for fishing, swimming, and other recreation. Class B waters can be used as public water supplies if treated, however surface waters in the Mill Brook and Pond Brook watersheds are not currently used for public water supplies. There are groundwater wells used for public water supplies within Pond Brook and Mill Brook. This includes the well at the South Pond Recreation Area, residential wells for homes in Stark and at North and South Pond. All of these wells are considerably downstream of the proposed project activities.

Under New Hampshire anti-degradation provisions, all waters of the White Mountain National Forest are designated as "Outstanding Resource Waters" (ORW), which requires the protection of surface water quality (NHDES 2007). Although ORW designation allows for some short-term changes in water quality, no activities are allowed that would lower water quality enough to threaten the existing and designated uses. The State has not assessed the project area's streams to determine if they support designated uses (NHDES 2006), however it is likely that the "aquatic life" and "primary/secondary recreation" designated uses are supported.

Water quality tests from 2005-2007 measured pH, conductivity, temperature, and turbidity in various locations along Mill Brook and its tributary streams (see the Water Resources report in the project file for water quality sampling data). The measured pH of the streams in the watersheds ranges from 6.2 to 7.0. Low turbidity measurements indicate that there is currently not an issue with sediment movement into surfaces waters in the watersheds. In addition, field review of streams in the watersheds indicated that embeddedness was low, so sedimentation of streams does not appear to be an issue. In 2006, total aluminum concentration was tested, with the result of 76.8 ppb at the lower end of Mill Brook. This is below the chronic standard for total aluminum in the state's water quality standards (NHDES 2007).

The values measured in the watersheds are within the range of values typically seen on the White Mountain National Forest (Hornbeck, et al. 2001). These values meet state water quality standards for aquatic life, such as fish and macroinvertebrates (NHDES 2007).

Water sampling in a Mill Brook tributary

No bacteria were detected in Mill Brook when tested in October 2007. Bacteria levels were not expected to be elevated since there are no high use recreation areas in Mill Brook which have been related to detectable bacteria levels (USDA Forest Service 2005a). A portion of the project area is in the Pond Brook watershed. There is a high use recreational area in the Pond Brook watershed at South Pond

and bacteria levels have been detected during times of high use, but not enough to be on the state's list of threatened or impaired waters (NHDES 2006).

Like all Northeast states, New Hampshire has a fish consumption advisory for fish taken from all freshwater due to mercury, which comes via atmospheric deposition (NHDES 2006).

Concerns from Stark citizens prompted a close look at the Old Road, immediately adjacent to Mill Brook in the historic floodplain of Mill Brook. Field investigations revealed erosion of the Old Road caused by the presence of side channels (secondary flood channels) with rock plugs that caused high stream flows to access the Old Road. There is concern that larger floods could cause Mill Brook to cut a new channel down the road. This could redirect flood flows and cause high sediment loads to move downstream, and reduce the capacity of the stream channel to hold water and increasing the potential risk of flood damage to the residents of Stark.

A short segment of road 2204 has been washed out by Mill Brook. Mill Brook is now using approximately 200 feet of the roadbed as a side channel. There is concern that during high flows more of the roadbed could be eroded, causing large sediment inputs to Mill Brook.

The best available science was used to assess the potential effects to water resources related to the Mill Brook project. Much of our understanding and conclusions about the relationship between water resources and vegetation management comes from research conducted at Hubbard Brook Experimental Forest, on the White Mountain National Forest. Other studies include locations within the same M212 Province (Bailey 1995) that have similar physical and biological characteristics as the White Mountain National Forest including the Mill Brook project area. This means that summaries and the use of research results in this document are supported by details and research papers in the project file.

Measuring Effects to Water Resources

The relevant water resources elements for the Mill Brook project are water quantity and water quality.

Research shows that timber harvest of about 25% of the basal area in first- and second-order watersheds is the threshold where water quantity changes are measurable (Hornbeck et al 1997). Studies show that stream chemistry changes can be prevented by using harvest methods that remove less than 15-19% of the basal area within a watershed, depending on its characteristics (Wang et al 2006, Lawrence and Driscoll 1988, and Martin et al 1984). Chemistry, temperature, and sedimentation are components of water quality analyzed in this document.

The Mill Brook proposals that have the potential to cause measurable effects to water quantity or quality are: timber harvest, road and landing work, skid trails, prescribed fire, and watershed restoration. Road classification or simple decommissioning would have no measurable effects on water resources since it involves very little, if any, ground disturbance.

Direct and Indirect Effects

Water Quantity

Direct and indirect effects on water quantity are analyzed using the watersheds of the first and second order perennial streams in Mill Brook and Pond Brook watersheds: East and West Branches of Mill Brook, Hickey Brook, Two Pond Tributary, Lower Mill Brook, Pepps Brook, Pucci Brook, Devils Hopyard Brook, and Cold Brook. The smaller watersheds are used because changes in water quantity could be evident at this scale as water flows downstream and is collected in these perennial streams, but may not be evident at a larger watershed scale.

The temporal scale to analyze direct and indirect effects on water quantity is 10 years in the past and ten years into the future since changes to water quantity parameters are no longer evident within 7-9 years (Hornbeck, et al 1987).

Alternative 1

There would be no new direct or indirect effects on water quantity from implementation of Alternative 1. Current and on-going management activities would continue but no new management activities would be initiated as a result of this proposal.

Alternatives 2 and 3

The largest basal area removals would be in Pepps Brook and Pucci Brook at 15-16% for both Alternatives. The remaining sub-watersheds range from 0%-5% removals (see Water Resources Report in the project for basal area calculations and percentages). No measurable increase in discharge is expected because basal area removal in all sub-watersheds is well below 25% where effects have been measured in similar watersheds (Hornbeck et al 1987). As described in the Forest Plan EIS, 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).

Fire also has the potential to increase water quantity. However model results from FOFEM (2007) for the proposed actions indicate that prescribed fires on the White Mountain National Forest do not consume all of the forest floor fuels and few canopy trees are killed. Fire personnel on Androscoggin Ranger District Fire confirm this result based on their experience with prescribed fires on the White Mountain National Forest. Thus the burns proposed to maintain the wildlife openings every 3-5 years in the Mill Brook watershed would have little effect on canopy interception, evapotranspiration, soil water storage, and overland flow processes as described by Baker (1990). Although there may be small, localized effects, due to the very small scale of burning it is unlikely that the proposed prescribed fire would increase water quantity in the watershed.

Water Quality

The Analysis Area for direct and indirect effects on water quality is the Mill Brook and Pond Brook watersheds and delineated subwatersheds of perennial streams in these larger watersheds These watersheds were selected because they includes all the headwaters of the streams which flow through the Project Area; and, at this scale, have the

potential to effect water quality (Wang et al. 2006, Lawrence and Driscoll 1988, Martin et al 1984 and others as listed in Crowley 2007). The temporal scope for direct and indirect effects on water quality is 10 years. Ten years is adequate for water quality analysis because research at Hubbard Brook has shown that the water chemistry for most parameters returns to levels found before harvest within 5 years following treatment (Hornbeck et al. 1986). Analysis of a larger watershed (the Upper Ammonoosuc River) would not be meaningful since in very large watersheds, no effect would be detected.

Alternative 1

There would be no new direct or indirect effects on water chemistry, temperature, or sediment from implementation of Alternative 1 except for the continued need for watershed restoration work. The segments of the Old Road and FR 2204 could continue to erode and possibly reroute high flows in Mill Brook, which could result in changes to the stream channel and continued or increased sedimentation as described in the project record and field notes. Other ongoing forest activities would not change water quality or impact existing uses.

Alternatives 2 and 3

Timber harvest has the potential to affect stream temperature and water chemistry within 1st order perennial streams, at a localized scale (Wang, et al 2006, Lawrence and Driscoll 1988, Martin et al 1984 and others as listed in Crowley 2007). However Forest Plan monitoring and other research suggests that the application of BMPs through Forest Plan standards and guidelines, effects related to water quality changes will be prevented (USDA Forest Service 2005b p. 3-51). Riparian buffers are considered an effective factor for preventing nutrients and sediment from reaching a watercourse (Gilliam 1994). Partial harvest and skid trail placement are also important factors (University of New Hampshire, 2005, Aust and C.R. Blinn 2004, and others). Other parameters, such as calcium and aluminum, are related to the amount of basal area removed within a watershed (Wang et al 2006).

A summary of research papers discussing the effects of timber harvest on water quality showed that water quality changes were detected when as little as 19% basal area was removed from 1st order watersheds (Lawrence and Driscoll 1988) but none of the studies showed changes in water quality when the percent reduction in basal area was 15% (Wang et al 2006, Martin et al 1984 and others as listed in Crowley 2007).

No measurable water quality changes are expected to occur within the analysis area watersheds as a result of the proposed Alternatives due to the application of BMPs including Forest Plan Standards and Guidelines as described in the Water and Soil Reports in the Project Record. This includes checking for the amount of basal area removed within 1st and 2nd order perennial watersheds and using watershed characteristics to ensure these levels maintain or protect water quality. The largest basal area removals would be in Pepps Brook and Pucci Brook at 15-16% for both Alternatives. The remaining sub-watersheds range from 0%-5% removals (see Water Resources Report in the project for basal area calculations and percentages). No measurable changes in water quality are expected because basal area removal in all sub-watersheds is well below 19% where effects have been measured in similar watersheds (Wang et al 2006, Lawrence and Driscoll 1988, Martin et al 1984 and others as listed in Crowley 2007).

This includes aluminum concentrations, including the monomeric portion, which should not increase as a result of either alternative since no water quality change is expected as summarized here and further discussed in the Soil and Water Reports in the Project Record.

Monitoring is being done across the Forest assesses the effectiveness of limiting the total basal area removed in first- and second-order watersheds to prevent water quality changes as outlined in the Forest Plan Monitoring Guide (USDA Forest Service 2006) and 2006 Monitoring Report (USDA Forest Service 2006e). In addition, on-going research through Plymouth State University, Hubbard Brook, and other groups is intended to improve the understanding of the connection between watershed characteristics, water quality, and timber harvest, Additional water quality tests are planned for this project area after operations are complete to assess any changes and add to our water quality database. This works to continually to improve the information on how watersheds respond to timber sale activities, thereby allowing timber harvest levels to be set at appropriate levels while maintaining water quality.

Research has shown that the usual harvest practices 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 Forest Plan Standards and Guidelines, BMPs, and project design features would minimize sedimentation of perennial streams (USDA Forest Service 2005b, NCASI, 2000, Stafford et al. 1996, Maine Department of Conservation 2005 and 2006).

Old Road Watershed Restoration: By restoring the floodplain and side channels to more natural conditions, flood flows would be allowed to spread out and dissipate energy rather than cause continued channel and road erosion and flooding concern in the town of Stark.

FR 2204 Watershed Restoration: Placing wood in the side channel which has formed on the roadbed of Road 2204 would slow velocities and promote sediment deposition. By dissipating energy it should help prevent flood flows from eroding more of Road 2204.

The proposed miles of road restoration maintenance may initially cause ground disturbance and sediment mobilization but in the long term road restoration maintenance will prevent sedimentation to streams. Best management practices (BMPs) will be used to minimize the potential for sediment to impact Mill Brook during road restoration maintenance activities. Research has shown that maintenance reduces sediment losses (NCASI 2000). The miles of road restoration maintenance proposed in the Mill Brook watershed to result in a long term decrease in sedimentation from the section of road restored through the proposed Alternatives as long as its condition is maintained.

Skidding across perennial streams would occur in three locations for Alternative 2 and two locations in Alternative 3. Bridges are used to cross perennial streams, and bridges, culverts, or poles would be used on intermittent streams, depending on size and season of use. Stream crossings can cause increased sediment inputs during installation and use (Stafford et al. 1996), so visual monitoring would occur at stream crossing sites to catch and rectify any problems in the early stage. This practice has been used successfully on the WMNF for many years, including on the Androscoggin Ranger District (email from sale administrator, R. Gilbert to Crowley/Weddle, 2004 in project file). This monitoring would continue until the crossing sites have successfully stabilized. All skidder crossings would be designed to pass bankfull flows, as

determined by a qualified person, and would be located to minimize potential sedimentation. 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 as revegetation occurs.

Field review of the proposed temporary bridge on FR 200 revealed no negative hydrologic impacts on the stream from the existing abutments so the use of these abutments would not result in any additional impacts to stream stability (see field notes in project file).

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. Table 7 lists the areas of disturbance predicted for Alternatives 2 and 3. Less than 1% of the watersheds would be affected, and as landings and skid trails revegetate, sediment movement would decrease to background levels. Sediment contributions from classified roads would continue; however, they would likely return to pre-project levels over time.

Table 7. Ground Disturbance, by Alternative

Activity	Alt 1	Alt 2	Alt 3
New Haul Road Stream Crossings (count)	0	1	1
Skidder Crossings on Perennial Streams (count)	0	3	2
Existing Landings (acres)	0	3.5	1.5
New Landings (acres)	0	2.5	2.5
Road Maintenance (miles/acres)	0/0	3.5/8.4	3.3/7.9
Skid Trails (miles/acres)*	0/0	8.65/20.76	5.35/12.84
Watershed Restoration (acres)	0	<1	<1
Total Disturbed Acres	0	35.16	24.76
Total % of Mill Brook/Pond Brook	0%	<1%/<1%	<1%/<1%

*1 mile of skid trail = average disturbance width of 20' = 2.4 acres of disturbance/mile

The wildlife openings proposed to be stumped and then maintained with prescribed fires are not near any streams and so proposed management would not affect water quality. Studies regarding protective measures and water quality responses to fire are summarized and included in the project file.

Any direct and indirect effects on water quality resulting from Alternatives 2 and 3 would be short-term and localized. Most studies show that BMPs are very effective at reducing or eliminating the transport of sediment into watercourses (summarized by Stafford et al. 1996). Ongoing monitoring during operations would ensure the implementation and effectiveness of Forest Plan standards and guidelines, project design features, and New Hampshire BMPs. Past timber sale contracts and sale administrator notes show that these protective measures are incorporated into timber sale contracts and applied on the ground, and specialists are called to resolve water and soil issues when needed (see project file). Protection of water quality and designated uses for the Outstanding Resource Waters in the project area is expected.

Cumulative Effects

Water Quantity

Cumulative effects for water quantity are analyzed using the watersheds of the first and second order perennial streams in Mill Brook and Pond Brook watersheds. These watersheds were selected because they include all the headwaters of the streams which flow through the Project Area; and, at this scale, the effects of multiple uses within the watersheds could become additive and result in cumulative effects. Analysis of a larger watershed (the Upper Ammonoosuc River) would dilute potential cumulative effects. Therefore, cumulative effects are analyzed for the smaller watersheds of the 1st and 2nd order streams.

The temporal scale to analyze cumulative effects on water quantity is ten years in the past and ten years into the future. This time period aligns with research showing that changes to water quantity parameters are not evident 7-9 years after timber harvest (Hornbeck et al 1987).

Timber harvest has occurred in the cumulative effects area in the last ten years; primarily on private lands (see Section 3.1). Analysis shows that when this past harvest is combined with the proposed level of harvest, basal area reductions do not exceed the 25% threshold (data in Mill Brook project file) in any of the first- or second-order watersheds where project activities are proposed. Therefore, there would be no measurable increases in flood flows or baseflows as a result of the proposed harvest activities in Mill Brook or Pond Brook. Some harvesting and associated roads may occur on private land in the next 10 years and on Forest Service lands, the North Kilkenny Vegetation Management Project has been planned. These activities are included in the basal area reduction calculations, which show that this cumulative activity would not cause basal area reductions to exceed 25%. There are no other activities occurring in the watersheds that would impact water quantity, and so it is unlikely that observable cumulative increases in water quantity, including increased peak flows, would result from the proposed project even when combined with other activities on private lands within the next 10 years.

Water Quality

Cumulative effects on water quality are analyzed using the first- or second-order watersheds of Mill Brook and Pond Brook. These watersheds were selected because they includes all the headwaters of the streams which flow through the project area; and, at this scale, the effects of multiple uses in the watersheds could become additive and result in cumulative effects. Analysis of a larger watershed (the Upper Ammonoosuc River) would dilute potential cumulative effects.

The temporal scope for cumulative effects on water quality is 10 years into the past and 10 years into the future. Ten years is adequate for water quality analysis because research at Hubbard Brook has shown that the water chemistry for most parameters returned to levels found before harvest within 5 years following treatment (Hornbeck et al. 1986).

Past and present activities and uses that occur in the cumulative effects area watersheds on Forest Service land which could affect water quality include timber harvest, recreation, residences, fire, and roads (see Section 3.1). There is no indication that

activities will deviate in type or scale from past and present activities within the next 10 years.

Although wildland fire occurred historically in the cumulative effects area watersheds, no wildland or prescribed fire has occurred in this area during the time frame analyzed. Prescribed fire to maintain the 11 acres of permanent wildlife opening is proposed and would occur in the next ten years. This is the only fire predicted in the watersheds, with no anticipated direct or indirect effects, and so cumulative effects of prescribed fire on water quality (including sedimentation) are not anticipated.

Temperature measurements collected in the cumulative effects area watersheds indicated cool temperatures which support the existing uses in the watersheds. The proposed project is not anticipated to cause increases in temperature because buffers leave canopy intact on perennial streams and the basal area reduction in each watershed is limited as described Cumulative effects related to stream temperature are not anticipated, even when combined with activities on private land.

No cumulative effects related to sediment are expected. As discussed previously, any direct or indirect effects are expected to be short-term and localized including those on private lands since state laws include BMPs to prevent impacts on private lands (New Hampshire 2004, University of New Hampshire 2005). Road maintenance should reduce potential sediment inputs of existing roads (NCASI 2000). No major erosion problems related to recreation were observed in the watersheds, and no recreation development projects are planned in the project area.

Water Quality and Atmospheric Deposition

The potential effects of vegetation management on water quality are of particular concern when combined with effects related to atmospheric deposition, or 'acid rain'. Atmospheric deposition occurs throughout the Northeast with effects to soil and water as summarized in Acid Rain, Revisited (Driscoll et al 2001). Acidity has been shown to mobilize inorganic aluminum in the soils, which then enters stream water (Lawrence and Driscoll 1988).

In 2006, total aluminum concentration was measured at 76.8 ppb at the lower end of Mill Brook. This is below the chronic standard for total aluminum in the state's water quality standards and meets water quality standards for aquatic life (NHDES 2007). It is likely that monomeric labile aluminum, a form of aluminum more toxic to aquatic life and related to atmospheric deposition (Lawrence et al 2007), is part of the total aluminum concentrations.

A summary of research papers discussing the effects of timber harvest on water quality showed that water quality changes were detected when as little as 19% basal area was removed from 1st order watersheds (Lawrence and Driscoll, 1988) but none of the studies showed changes in water quality when the percent reduction in basal area was 15% (Wang et al 2006, Martin et al 1984 and others as listed in Crowley 2007). Therefore, the percent of basal area removed in each 1st and 2nd order watershed was used as an indicator of water quality changes as previously discussed. In order to assess cumulative water quality changes related to the proposed activities and the additional effect of atmospheric deposition and timber harvest on private lands within the same watersheds, these calculations were rerun to include the amount of basal area removed from these activities. The calculations did not cause any of the percent basal area removed within the watershed to increase appreciably. The highest

removals were still 15-16%, making it unlikely that measurable changes in pH or other parameters would occur, even when combined with other vegetative management activities in the cumulative effects area, and when combined with the effects of atmospheric deposition. In addition, since basal area reductions within the watersheds are 15-16% or less and combined with mitigative practices such as riparian buffers, it is also expected the monomeric labile aluminum part of total aluminum would not be increased as a result of the proposed activities.

In summary, because the basal area proposed for removal in each first- and second-order perennial watershed would no more than 15-16%, less than the levels where water quality effects have been observed, there is a low risk of adding to cumulative effects on water quality and the beneficial uses, such as fisheries, would continue to be supported. This includes analysis of all activities in the watersheds that could affect water quality.

3.13 Eligible Wild and Scenic Rivers

Data and other supporting information for the following analysis is located in the project file and incorporates information and conclusions for the resources relevant to Eligible Wild and Scenic Rivers, including the outstandingly remarkable values listed in Table 10, and the classification criteria listed in Table 11.

Affected Environment

In 1991, the White Mountain National Forest completed an assessment of rivers on the Forest to determine their eligibility for potential future inclusion in the National Wild and Scenic River System (NWSRS). Based on this assessment, 36 rivers were identified as potentially eligible for Wild and Scenic River designation. These 36 rivers with their potential classifications (Wild, Scenic, or Recreational) were incorporated into the Forest Plan (USDA Forest Service, 2005a, Appendix C). Mill Brook, a portion of which is within the Mill Brook project area, is identified as an eligible Wild and Scenic River on this list.

The Wild and Scenic Rivers Act requires identification and protection of **outstandingly remarkable values** (ORVs) for each river. The 1991 assessment did not identify specific ORVs for each of the listed rivers. Therefore, this analysis will consider effects to all potential ORVs for resource values detailed in Forest Service Handbook 1909.12 (Chapter 82.14a) and described in Table 10 below. This approach provides for the protection of all potential ORVs until we are able to evaluate these values for all 36 rivers listed as eligible on the Forest.

Table 10: Potential ORVs and their Descriptions

Potential ORV	Description
Scenery	The landscape elements of landform, vegetation, water, color, and related factors result in notable or exemplary visual features and/or attraction.
Recreation	Recreational opportunities are, or have the potential to be, popular enough to attract visitors from throughout or beyond the region of comparison or are unique or rare within the region.
Geology	The river, or the area within the river corridor, contains one or more examples of a geologic feature, process or phenomenon that is unique or rare within the region of comparison.
Fish	The river is nationally or regionally an important producer of resident and/or anadromous fish species or the river provides exceptionally high quality habitat for fish species.
Wildlife	The river, or area within the river corridor, contains nationally or regionally important populations of indigenous wildlife species or the area provides exceptionally high quality habitat for wildlife of national or regional significance.
Historic and Cultural	The river, or area within the river corridor, contains important evidence of occupation or use by humans. Sites may have national or regional importance for interpreting history or prehistory.
Other Values	No specific national evaluation guidelines have been developed for the “other similar values” category, but may include hydrology, paleontology, and botany resources.

Mill Brook is a small, rocky drainage typical of many New England streams. Water flows over and around moss-covered rocks and through shallow pools. There are no large waterfalls or other major geologic formations in the stream corridor. In its lower reaches a side channel has been intentionally blocked, altering the natural flow of the brook during high-water events. Vegetation along the banks is typical of the area with

Northern Hardwoods and areas of Spruce/Fir. See Water Resources (Section 3.12) and Fish and Aquatic Habitat (Section 3.3) for a thorough description of the brook.

Mill Brook's eligible segments total 4.1 miles – one segment is 3.9 miles, and one is 0.2 miles. Both segments are in or adjacent to the Mill Brook project area. The eligible segments begin at the crossing under FR 11 just north of the junction with the West Branch of Mill Brook and continue downstream to the confluence with the Upper Ammonoosuc River. Approximately 0.7 miles of Mill Brook runs through a private inholding owned by the Kennebec West timber company; the lower 0.5 miles of the stream flows on private land or land owned by the Town of Stark. No record of why Mill Brook was segmented or precisely where the 0.2 mile segment is located has been discovered; the best estimate is that the 0.2 mile segment is the section from NH Route 110 to the confluence with the Upper Ammonoosuc River. The 1991 river assessment identified the potential classification of both segments as **Scenic**. Scenic rivers are defined 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 (Federal Register, Vol. 27, No. 173, September 7, 1982).

The classification criteria for Scenic river areas are described in Table 11 below:

Table 11: Classification Criteria for Scenic River Areas*

Attribute	Scenic
Water Resource Development	Free of impoundment.
Shoreline Development	Largely primitive and undeveloped. No substantial evidence of human activity. The presence of small communities or dispersed dwellings or farm structures is acceptable. The presence of grazing, hay production, or row crops is acceptable. Evidence of past or ongoing timber harvest is acceptable, provided the forest appears natural from the riverbank.
Accessibility	Accessible in places by road. Roads may occasionally reach or bridge the river. The existence of short stretches of conspicuous or longer stretches of inconspicuous roads or railroads is acceptable.
Water Quality	No criteria are prescribed by the Wild and Scenic Rivers Act.

* Federal Register, Vol. 47, No. 173, September 7, 1982

The potential scenic classification of Mill Brook takes into account:

- the proximity to FR 11,
- leased camps directly adjacent to the brook on private land,
- evidence of timber harvest on private land,
- existing bridges and bridge abutments,
- present and historic management activities on National Forest System lands,
- the brook's course through a portion of the town of Stark, and
- Its crossing under NH Route 110.

Forest Plan standards require the Forest Service to: "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 82.5) requires the free-flowing condition, ORVs, and inventoried classification of eligible

Mill Brook is accessible by road in several locations. This view is looking upstream toward the bridge at the south end of FR 11

rivers be protected. The Wild and Scenic Rivers Act defines free-flowing as: "existing or flowing in a natural condition without impoundment, diversion, straightening, rip-rapping, or other modification of the waterway".

Forest Service Handbook 1909.12 (Chapter 82.51) also provides interim management guidelines for eligible river corridors according to classification. Guidelines applicable to the portions of the Mill Brook project that occur in the Mill Brook corridor are:

- Water Resources Projects (Water Supply/Flood Control) – Water resources projects will be analyzed as to their effect on a river's free-flowing condition, water quality, and outstandingly remarkable values, with adverse effects prevented to the extent of existing agency authorities.
- Transportation System – New roads and railroads are permitted to parallel the river for short segments or bridge the river if such construction fully protects river values (including river's free-flowing character). Bridge crossings and river access are allowed.
- Vegetation Management – A range of vegetation management and timber harvest practices are allowed, provided that these practices are designed to protect, restore, or enhance the river environment, including the long-term scenic character.

Measuring Project-level effects to Mill Brook's Wild and Scenic River Eligibility

The proposed activities in the Mill Brook project that could have a measurable effect on Mill Brook's Wild and Scenic River eligibility are: timber harvest, road and bridge work, skid trails, wildlife opening maintenance, and watershed restoration. Road classification is merely an adjustment to a database, and road decommissioning work would take place outside the bed and banks of the stream. Further, decommissioning work would be designed to stabilize and restore the natural appearance of the roadbed and road surface. Therefore, these activities are expected to have no measurable effects on resources within the corridor, and would therefore not affect the eligibility of Mill Brook.

- Effects to the free-flowing condition of the eligible segments are measured by activities that could affect the streambed or banks of the river.
- Effects to the potential classification are measured by the degree of Water Resource Development, Shoreline Development, and Accessibility.
- Effects to Outstandingly Remarkable Values are measured by effects to scenery, recreation, fish, wildlife, geology, historic and cultural, and other values.

Direct and Indirect Effects

The Analysis Area for direct and indirect effects on this eligible Wild and Scenic River is the river bed/banks and ¼ mile from the ordinary high water mark of Mill Brook along the eligible segments from the crossing under FR 11 to the confluence with the Upper Ammonoosuc River. This analysis area was chosen because it defines the stream corridor (Forest Service Handbook 1909.12, section 82.14). The time frame is the actual duration of the Mill Brook project, expected to be 2 to 4 years, depending on the alternative selected and on sale operations. This duration was selected because when the management activities cease, so will the majority, if not all, of the direct and indirect effects. The components of the Mill Brook project that would occur within the analysis area are described in Table 12.

The analysis of direct and indirect effects below addresses all three factors related to the protection of eligible Wild and Scenic Rivers: 1. Free-flowing condition, 2. Classification, and 3. ORVs.

Effects on Free-Flowing Condition

Alternative 1

Failure to implement the watershed restoration projects would have a negative effect on the free-flowing condition of Mill Brook. These projects are designed to help restore natural function of the river channel, side channels, and floodplains. Please see the Water Resources section for additional discussion on the effects of this alternative on the natural function of Mill Brook.

Alternative 2

Under Alternative 2, activities proposed in the Mill Brook eligible corridor include harvest in 14 stands, a truck crossing of Mill Brook on FR 200 (a temporary bridge would be installed on existing concrete abutments), road restoration maintenance on two roads, two watershed restoration projects, and ongoing permanent wildlife opening maintenance.

Under Alternative 2, these existing concrete abutments would support a temporary bridge on FR 200 to access six harvest units on the west side of Mill Brook. The free-flowing condition of the brook would not be affected.

Table 12: Project Components in the Mill Brook Eligible Wild and Scenic River Direct and Indirect Effects Analysis Area

Alternative	Project Components in the Analysis Area (River Corridor)
1	• None
2	• Approximately 242 acres of timber harvest:
	• 145 acres of individual tree/group selection harvest in stands 2-45, 2-30, 2-12, 2-19, 4-15 and 4-34.
	• 43 acres of improvement harvest in stands 2-16 and 2-34d.
	• 37 acres of group selection harvest in stands 2-34 and 2-34e.
	• 5 acres of overstory removal harvest in stand 3-16a.
	• 2 acres of patch clearcut or clearcut harvest in stand 2-34b.
	• 9 acres of permanent wildlife opening (PWO) creation through clearcut harvest and stumping in stands 2-29a and 3-13a.
	• 11 acres of PWO maintenance in stands 2-29a and 3-13a by mowing or prescribed burning. Maintenance would be ongoing and occur every 3-5 years.
	• No new road construction. A temporary bridge would be placed across Mill Brook on existing concrete abutments on FR 200. Road restoration maintenance would occur on 0.2 miles of FR 200 and on 0.3 miles of the Old Road. 2.3 miles of unauthorized road would be designated as Forest Roads (2205.1, 2204, 200, 199, Old Road) and 1.8 miles would be decommissioned (2204, 200, 199, Old Road).
	• 3 landings constructed; 5 existing landings improved
	• 2 watershed restoration projects
3	• Approximately 105 acres of timber harvest:
	• 53 acres of individual tree/group selection harvest in stands 2-45 and 2-30.
	• 9 acres of improvement harvest in stand 2-34d.
	• 37 acres of group selection harvest in stands 2-34 and 2-34e.
	• 5 acres of overstory removal harvest in stand 3-16a.
	• 2 acres of patch clearcut or clearcut harvest in stand 2-34b.
	• 4 acres of permanent wildlife opening creation through clearcut harvest and stumping in stand 2-29a.
	• 4 acres of PWO maintenance in stand 2-29a by mowing or prescribed burning. Maintenance would be ongoing and occur every 3-5 years.
	• No new road construction. Road restoration maintenance would occur on 0.3 miles of the Old Road. 2.3 miles of unauthorized road would be designated as Forest Roads (2205.1, 2204, 200, 199, Old Road) and 1.8 miles would be decommissioned (2204, 200, 199, Old Road).
	• 3 landings constructed; 1 existing landing improved
	• 2 watershed restoration projects

The timber harvesting, landing construction and improvement, and permanent wildlife opening maintenance activities would be located outside the bed and banks of the stream and therefore would not affect free-flowing condition.

Placing a temporary bridge on FR 200 would not further affect the current free-flowing condition of the river because the permanent concrete abutments are currently in place. Road restoration maintenance would not affect the free-flowing condition because the work would take place outside the bed and banks of the stream.

The watershed restoration projects are expected to have beneficial effects on the free-flowing condition of the stream. Roughening old road surfaces, placement of woody debris, and restoration of side channels would mimic natural processes and improve within-channel, riparian, floodplain, and upland conditions and function by dissipating energy, reducing erosion, improving sediment retention, and decreasing the impact of high-flow events.

Alternative 3

Proposed activities in this alternative include harvest in 7 stands, road restoration maintenance on one road, and two watershed projects.

The timber harvesting, landing construction and improvement, road classification/decommissioning, and permanent wildlife opening maintenance activities would be located outside the bed and banks of the stream and therefore would not affect free-flowing condition.

The effects of the watershed restoration projects would be the same as in Alternative 2.

Effects on Classification

Analysis in this section focuses on the water resource development, shoreline development, and accessibility classification criteria for scenic rivers. The Wild and Scenic Rivers Act does not prescribe criteria for water quality for the scenic classification; therefore, that criterion will not be analyzed. Alternatives 2 and 3 propose management actions within the corridor. Table 13 describes effects of all alternatives on pertinent classification criteria.

In summary, Alternative 2 would only affect classification criteria during and immediately following harvest and watershed restoration activity. Alternative 3 would only affect classification criteria during implementation of the watershed restoration projects. Effects associated with both action alternatives are within the standards for scenic classification for Water Resource Development and Accessibility. Consistent with classification criteria for Shoreline Development, evidence of past or ongoing timber harvest is acceptable because the forest will appear natural from the riverbank. The terrain in the area of stands 2-12, 2-19 and 2-30 is in some places 50 feet higher than the water level, effectively limiting the amount of treated area visible from Mill Brook. For those areas that are visible, the single tree and group selection treatments would reduce stand density, while maintaining a natural-looking forested landscape.

Effects to Potential Outstandingly Remarkable Values

This analysis considers the potential effects to all values identified in Handbook 1909.12, Chapter 82.12, *Outstandingly Remarkable Values*, which are listed in Table 10. This effects analysis draws on information provided by other resource specialists on the Interdisciplinary Team, and the scientific basis for the conclusions is the same as in those resource sections.

Scenery: Please see the Scenic Resources section of this document for more information. The Mill Brook eligible segments have scenic integrity objectives of High, Moderate, and Low, and scenic classes 1 and 3-6 which measure the relative importance of a discrete landscape area. The scenic attractiveness for Mill Brook is predominately Class C, indistinctive, with small sections of Class B, typical. Scenic attractiveness is based upon human perceptions of the intrinsic beauty of landform, water characteristics,

Table 13: Summary of Effects Scenic Classification Criteria of the Mill Brook Eligible Wild and Scenic River by Alternative

Alternative	Water Resource Development	Shoreline Development	Accessibility
1	No impoundments are proposed. Permanent bridge abutments currently exist on FR 200 but would not be used in this project.	Past harvest activity and existing camps would remain.	Road and bridge structures would remain.
2	No impoundments are proposed. Permanent bridge abutments currently exist on FR 200 but resulting in no change to the current condition.	Individual tree and group selection harvest in stands 2-12, 2-19, and 2-30 would likely be visible from the stream bank, but would appear natural to the average visitor following harvest activity. During harvest operations human activity associated with timber harvest and truck hauling would be evident in these stands and on sections of FR 11, 200, and 2204. Human activity would be evident during the watershed restoration projects; following completion of the projects, most visitors would not recognize evidence of these activities. Other proposed activities would not affect shoreline development because they would not be visible from the brook due to terrain and vegetation.	The restoration maintenance work planned on FR 200 and the Old Road totals approximately 0.5 miles, and only smaller portions would be visible from the stream bank. The presence of a temporary bridge is acceptable in a scenic river area; the bridge will be present only for the duration of the timber harvesting activity. Other proposed activities would not affect accessibility.
3	Same as Alternative 2.	Only a portion of stand 2-30 would potentially be visible from the stream bank (see Scenery section). The effects of the watershed restoration work and other proposed activities would be the same as in Alternative 2.	Road restoration work would only occur on the Old Road, most of which would not be visible from the stream bank due to terrain and vegetation. The temporary bridge would not be installed; however the permanent abutments would remain in place. Other proposed activities would not affect accessibility.

vegetation pattern and cultural land use. The Mill Brook corridor is considered concern level 1, the highest degree on a relative scale used to compare degree of public importance placed on landscapes viewed from travel corridors and use areas. Views along the corridor are typical of northern New England, with northern hardwood forests, rocky, moss-covered stream channels, and steep slopes in many places. The river passes a few natural openings created by beaver activity. Several private camps are visible, as is timber harvest activity on private land. The lower sections of the brook flow through the town of Stark.

Under Alternative 2, even-aged treatments would not be visible from Mill Brook. As described above, the terrain in the area of stands 2-12, 2-19 and 2-30 is in some places 50 feet higher than the water level, effectively limiting the amount of treated area visible from Mill Brook. For those areas that are visible, the single tree and group selection treatments would reduce stand density, while maintaining a natural-looking forested landscape.

Restoration of FR 200 and the Old Road will change the grassed over and/or grown-in appearance to that of a gravel-surfaced road free of vegetation. Only the sections of road immediately adjacent to the river would be visible from the riverbank. The installation of the temporary bridge would alter specific views from the brook in the immediate vicinity of the bridge for the duration of harvest activities.

The watershed restoration work would mimic natural processes and therefore not substantially affect the scenic resources along the stream corridor.

Due to location, other proposed activities would not affect scenic resources along the corridor.

Alternative 3 would not include treatments in Stands 2-12 or 2-19, or the installation of the temporary bridge and restoration of FR 200; therefore the affects to scenery would be limited to the visible portion of Stand 2-30 and the small section of Old Road visible from the brook. Effects of the watershed restoration projects and other proposed activities would be the same as in Alternative 2.

In summary, while there may be slight changes to what is seen from the corridor in the short-term, no substantial or long-term effects to the scenic resources along Mill Brook are expected under any of the alternatives.

Recreation: The Mill Brook area provides dispersed recreation opportunities including fishing and swimming similar to many other rivers and streams on the White Mountain National Forest. Use is generally low and primarily from seasonal users of leased camps in the vicinity and local residents in nearby towns. The Unknown Pond Trail at the upper terminus of the eligible section receives low use as does FR 11 which is part of the snowmobile trail system.

Recreational visitors along the stream corridor may experience noise due to truck traffic and harvesting operations. Noise associated with harvest activity may be apparent to visitors within one or two miles of logging operations. This estimate is based on data and analysis gathered by a recent forestry noise study that measured the decibel levels of various harvesting machinery (Neitzel and Yost 2003). The distance is generally based on the assumptions of average decibels produced by machinery and measured over distance from the specific source. The sound to distance estimate does not take into account the buffering effects of vegetation, wind, or topography, and the sound of the brook itself; which will further reduce the sound (Timerson 1999). Noise effects will be limited to this area surrounding harvest units and for the duration of vegetation management activities.

Effects on recreational users of the stream corridor would be minimized since the majority of stands in the analysis area are slated for fall or winter harvest, when recreational use of the river is lowest.

Restoration activities along the Old Road in both action alternatives may affect informal recreation use of this route to access the brook for fishing and swimming. Informal

foot traffic will still be feasible, but will become more difficult due to the placement of woody debris and roughening of the surface of the road.

Other proposed activities would not affect recreation opportunities along the corridor under either alternative.

Geology: There are no known economic mineral deposits or recreational rock/mineral collecting activities associated with Mill Brook. There are no landforms of local or regional importance along the corridor.

No effects upon the geology of the corridor are anticipated resulting from any project component under any alternative. Project activities are designed to protect soils and riparian areas (see those sections of the EA). As a result, landforms which are associated with the brook will be maintained.

Fish: Mill Brook provides habitat for and supports a population of wild brook trout, as well as a population of wild brown trout as described in greater detail in the fisheries section of this document.

For Alternatives 2 and 3 no harvest would occur within 25 feet of perennial stream banks. This would reduce or eliminate any sedimentation entering the stream from harvest implementation and therefore protect fish habitat (see Water Resources section for additional information and references regarding sedimentation).

Installation of the temporary bridge over Mill Brook under Alternative 2 may result in minor sedimentation at this site; however, because the bridge abutments are in place the amount of disturbance is expected to be minimal. Consequently, installation of the bridge is expected to have no effect on brook trout populations or habitat. See the fisheries section for additional information.

Watershed improvement projects in Alternatives 2 and 3 would have little direct effect on aquatic life. Failure to respond to the existing condition along the Old Road (Alternative 1) could have negative effects to the lower reaches of Mill Brook due to erosion and sedimentation resulting from high water flows.

Other proposed activities would not affect fish populations or habitat. Please see the fisheries section for additional information.

Wildlife: Terrestrial wildlife populations and habitats are not unique or rare in the analysis area. Generalist species frequent the area, but no unique population is supported. Please see the Wildlife section in the EA and the Biological Evaluation in the project file for more information.

The aquatic environment provides suitable habitat for two mayfly species that are on the Regional Forester's sensitive species list. One of these species, Third Ameletus Mayfly (*Ameletus tertius*) has been recorded in the perennial streams of the Mill Brook watershed. Brown's Ameletus Mayfly (*Ameletus browni*) may occur in the perennial streams of the Mill Brook watershed. The Brown's and Third Ameletus mayflies have habitat requirements similar to those found in Mill Brook, including well-oxygenated, canopy covered, and rocky streams. Alternative 1 would have no effect on these species because no activities would occur to affect riparian habitat. Under Alternatives 2 and 3, Forest Plan standards and guidelines and best management practices will protect streams during harvest activity, landing construction and improvement, road restoration, and bridge installation. These practices will minimize reduction in canopy cover, removal of riparian vegetation, and sedimentation. Impacts to these mayflies and

other aquatic species are expected to be localized and short-term. See the Biological Evaluation for additional information on these species.

Historic and Cultural: A cultural resource paraprofessional surveyed this area and received concurrence on the submitted report from the State Historic Preservation Office in 2006. Effects to historical and cultural resources are not anticipated under any alternative. See Heritage Resources (Section 3.4) for more information.

Other Values: To date, no other values have been identified as outstandingly remarkable along Mill Brook. Hydrology and botany resources have been considered in this evaluation; please see those sections of the EA for more information.

Summary of Effects to Eligibility Criteria

Table 14 describes the effects of each alternative on the eligibility criteria for which these segments of Mill Brook could be included in the National Wild & Scenic Rivers System.

Table 14: Summary of Effects on Potential ORV's

Alternative	Description of Effects
1	Not implementing watershed restoration projects could have negative effects on aquatic habitat in the future. No other effects are expected.
2	Scenery – The temporary bridge, road reconstruction, portions of 3 harvest units, and the watershed restoration project will alter the scenery in specific locations, but will not change the scenic character of the river area.
	Recreation – The effects to recreation will be very localized and temporary. The proposed actions would not prevent consideration of recreation as an ORV in the future.
	Geology –There will be no effects to geology. The proposed actions would not prevent the consideration of Geology as an ORV in the future.
	Fish – The projects proposed may result in minor, localized sedimentation but no long term effects are anticipated on fish resources. The proposed actions would not prevent consideration of fish as an ORV in the future as a result.
	Wildlife – Use of best management practices, including Forest Plan standard and guidelines will minimize or eliminate any effects to wildlife. The proposed actions would not prevent consideration of wildlife as an ORV in the future.
	Historic and Cultural – There are no expected effects to known sites; newly discovered artifacts will be protected with contract provisions during project implementation.
	Other Values – None identified for this river.
3	Effects less than Alternative 2 due to reduced acres of harvest, reduced road restoration, no temporary bridge.

As described in the table above, no significant effects are anticipated under any alternative for any potential ORV. No actions proposed in the Mill Brook Project are anticipated to affect the future consideration of ORVs for either segment of Mill Brook.

Cumulative Effects

See Map 6 and Section 3.1 for location and projects considered in the following cumulative effects analysis.

The analysis area for cumulative effects on eligible Wild and Scenic Rivers is the river bed/banks and ¼ mile from the ordinary high water mark of Mill Brook along the entire eligible section of Mill Brook – the same analysis area as for direct and indirect effects. This analysis area was chosen because it allows for consideration of the entire Mill Brook corridor that is identified as eligible in the Forest Plan (USDA Forest Service 2005a, App. C). 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 1991 and those that may occur before 2020, when the next Forest Plan revision may take place.

Alternative 1

The cumulative effect of Alternative 1 on free-flowing condition, classification criteria, and ORV's would be the same as the direct and indirect effects.

Alternatives 2 and 3

Since there would be no direct or indirect effects on the free-flowing condition of Mill Brook other than the beneficial effects of the watershed restoration projects, only beneficial cumulative effects to free-flowing condition are expected with implementation of Alternatives 2 or 3.

In combination with the evidence of timber harvest on 192 acres of private land, harvest on 215 acres of National Forest land, and the existence of the leased camps, harvest associated with Alternative 2 would slightly increase the evidence of human activity related to the Shoreline Development classification criterion. Since the direct and indirect visual effects of harvest are expected to be minimal, the appearance of human activity will not substantially increase over what is presently observable in the river corridor. The temporary bridge on FR 200 would slightly increase effects to the Accessibility classification criterion while it is in place, as it adds a fourth crossing of the river in addition to the existing bridge on private land (unclassified road 2205.1) and two bridges in the town of Stark. Because there were no direct or indirect effects associated with the Water Resource Development classification criterion, there would be no cumulative effects either. Additionally, because no direct or indirect effects would result from other proposed activities, no cumulative effects to any classification criteria would result either.

The remainder of the cumulative effects discussion will focus on effects to the ORV eligibility criteria of scenery, recreation, fish, and wildlife. For the other ORV eligibility criteria (geology, cultural and historic, and other values), no direct and indirect effects are anticipated, therefore no cumulative effects are expected.

Scenery: As discussed above in cumulative effects to the Shoreline Development classification criterion, the visual effects of harvest, road restoration, placement of a temporary bridge, and implementation of the watershed improvement projects associated with Alternative 2 would cumulatively increase the visual evidence of human activity within the river corridor. However, because the forest condition will appear largely natural to most observers following harvest in these three stands, the bridge

will be removed following harvest activity, and only small portions of roads will be visible from the riverbank, there will only be a slightly increased effect to scenic resources over what is presently visible from the river corridor. Implementation of Alternative 3 would have a commensurately lesser effect on scenery resulting from fewer proposed activities.

Recreation: Under Alternative 2, the cumulative effects to recreation are essentially the same as the direct and indirect effects. The noise of harvest activity would combine with vehicle use of FR 11, and would be audible from several locations within the river corridor. Alternative 3 would have a commensurately lesser effect on views enjoyed and noise heard by recreationists along the river due to fewer proposed activities.

Fish and Wildlife: The activities listed in Section 3.1 may result in some localized and short-term sedimentation to Mill Brook. However, application of Best Management Practices, Forest Plan standards and guidelines, and project design features as well as compliance with state law will preclude significant long-term or cumulative effects, even when the proposed activities are combined with past and reasonably foreseeable activities described in Section 3.1. Permits issued by the New Hampshire Wetlands Bureau on private lands comply with state laws (RSA 482-A) that regulate activities in wetlands aimed at protecting the river corridor. Cumulative sedimentation is not expected to affect fish or wildlife values within Mill Brook and the river corridor resulting from selection of either Alternative 2 or 3. Because there would not be any direct or indirect effects to wildlife, there are no expected cumulative effects to wildlife in the river corridor.

In summary, the cumulative effects of either action alternative proposed under the Mill Brook project are not anticipated to prevent consideration of any of the resources described above as ORVs in the future.

3.14 Wildlife

The following analysis summarizes the information contained in the report entitled "Non-Native Invasive Species And Wildlife Report And Summary Of Biological Evaluation For Federally Endangered, Threatened, and Proposed Species and Regional Forester Sensitive Species for the Mill Brook Project" completed by the District Wildlife Biologist. The Report is located in the project file along with all supporting documentation and data used in this analysis.

Affected Environment

The project area is in the Mill Brook Habitat Management Unit (HMU). Field visits and literature reviews reveal that a wide array of wildlife species use the White Mountain National Forest seasonally or year-round. Many species use multiple forest age classes and habitat types (DeGraaf and Yamasaki 2001, DeGraaf et al. 2006), and so the Forest is managed to provide a broad range of habitat conditions (USDA Forest Service 2005a, pp. 1-20 and 1-21, USDA Forest Service 2005f, USDA Forest Service 2007).

The best available science was used in the 2005 Forest Plan to develop goals, objectives, standards, and guidelines to manage wildlife species and their habitats. This wildlife effects analyses tiers to the Record of Decision for the Forest Plan, its FEIS and supporting documents, and incorporates information by reference (USDA Forest Service 2002c, USDA Forest Service 2005a, USDA Forest Service 2005b pp. 3-73 through 3-112, 3-165 through 3-207, 2005f, USDA Forest Service 2007). Additional literature and site-specific monitoring and field reviews (cited throughout this report) also were used to assess effects to wildlife.

Supporting data and information regarding affected environments, habitat objectives, and effects conclusions are detailed in the report entitled Non-Native Invasive Species and Wildlife Report and Summary of Biological Evaluation for Federally Endangered, Threatened, and Proposed Species and Regional Forester Sensitive Species for the Mill Brook Vegetation Management Project (hereafter referred to as the Wildlife Report) in the project file.

Mill Brook HMU

The Mill Brook HMU contains the headwaters of Mill Brook and several tributaries. There are no large bodies of water in the HMU, however small wetlands, beaver ponds, vernal pools, and seeps occur throughout.

The current habitat composition and age classes are displayed in Table 15 for Management Areas 2.1, 6.1, and 6.2 lands (see Section 1.0 for a description of management areas). Existing habitat types and age class information come from corporate databases, GIS shapefiles, reviews of stand records, and field examinations.

Table 15 displays the habitat condition based on 2008 which is the first year that harvesting might occur.

Some of the northern hardwood and mixedwood stands (including some of the stands proposed for treatment) are on spruce-fir Ecological Land Types (see Section 3.10 for a discussion of ELTs) but converted from spruce-fir to hardwood or mixedwood after intensive past management, and currently have spruce-fir in the understory. These stands support wildlife species that prefer hardwood forest habitat, though stands with

Table 15. Mill Brook HMU 2008 Habitat Condition (acres are approximate).

Habitat	Acres in MAs 6.1 and 6.2[1]	Acres in Management Area 2.1				
			Age Class[2]			Unsuitable for Harvest[3]
	Current Condition	Current Condition	Regeneration (0-9 years old)	Young	Mature	
Hardwood	1298	6461	96	978	5387	1,002
Mixedwood	3357	931	0	58	873	405
Spruce-fir	1162	710	0	0	710	212
Aspen-birch	2037	856	0	48	806	186
Hemlock	0	8	n/a	n/a	n/a	8
Wildlife Opening	0	1	n/a	n/a	n/a	n/a
Non-forest	32	72	n/a	n/a	n/a	n/a
TOTAL	7886	9039	96	1084	7776	1813

[1]Most acres outside of MA 2.1 are mature forest, regardless of type, though natural disturbance may result in small amounts of regeneration and young age forest.
[2]Age classes for habitat types are defined in Appendix D of the Forest Plan.
[3]Unsuitable for harvest = FEIS p 33.

a thick spruce-fir understory may also have species using the softwood understory for food and cover.

Most of the aspen-birch habitat in the HMU is a result of an intense fire in the early 1900s and is now mature and old enough that the trees are dying. Existing aspen-birch forest is on a mix of ELTs, so some stands have a hardwood understory and others have spruce-fir forest developing. Most of the aspen-birch in MA 2.1 is on hardwood ELTs.

Expanding managed permanent wildlife openings or creating new ones depends on site-specific factors such as soils, diversity of herbaceous shrub cover, amount of woody saplings, soft mast (berries), proximity to roads (access for maintenance), potential productivity, topography, and proximity to softwood cover. Currently there is one permanent wildlife opening in the Mill Brook HMU that is maintained in an open condition using prescribed fire and/or mechanical treatment to maintain it in an open condition.

None of the mature habitat in the Mill Brook HMU is old growth forest as defined in the Forest Plan (USDA Forest Service 2005a, Glossary, p. 21).

Management Indicator Species

The White Mountain National Forest uses Management Indicator Species (MIS) to track five major habitats forest-wide. MIS are used to evaluate how wildlife is affected by timber harvest. These species, their corresponding habitats, forest-wide monitoring and population trends are discussed in detail in the Forest Plan FEIS (USDA Forest Service 2005b, pp 3-166 through 3-187). Table 2 in the Wildlife Report in the project file is incorporated by reference and summarized below. It shows the representative habitats, population trends, and the probability of occurrence in the Mill Brook HMU for all five MIS. In summary:

All of the MIS have been detected in and adjacent to the project area during Forestwide Breeding Bird **Surveys along the Mill Brook wildlife transect that traverses the project area.**

1. **Chestnut-sided warblers** are the MIS for regeneration-age northern hardwood habitat, which is present in the HMU. Regional surveys and WMNF monitoring show a decline in populations.
2. **Scarlet tanagers** are the MIS for mature northern hardwood habitat, which is present in the HMU. Regional surveys show stable populations, while Forest monitoring shows no statistical trend on the WMNF.
3. **Magnolia warblers** are the MIS for regeneration-age softwood habitat, which is not present in the HMU, however there are patches of regeneration age softwood and mixedwood present as inclusions in other habitat types. Regional surveys show stable populations, while Forest monitoring shows no statistical trend on the WMNF.
4. **Blackburnian warblers** are the MIS for mature softwood habitat, which is present in the HMU. Regional surveys show stable populations, while Forest monitoring shows no statistical trend on the WMNF.
5. **Ruffed grouse** are the MIS for all ages of aspen-birch habitat, which is present in the HMU. Regional surveys show a gradual decline in populations, while Forest monitoring shows no statistical trend on the WMNF.

Regional surveys results are breeding bird survey data summarized in the FEIS (USDA Forest Service 2005b pp. 3-170 through 3-174). White Mountain National Forest breeding bird survey data results are from MacFaden and Capen 2000, and the Mill Brook wildlife transect results are unpublished survey data from the White Mountain National Forest.

Habitats of Concern

Landscape analyses and field reviews were conducted to identify any existing outstanding natural communities, vernal pools/seeps, bear-clawed beech trees, and deer wintering areas (field notes in project file). No outstanding natural communities were found, however the other three habitats do exist and were examined in this analysis.

Vernal Pools/Seeps: Vernal pools are valuable habitat to certain species of amphibians and reptiles; and seeps provide food and water for wildlife, as well as habitat for rare plants (Calhoun and deMaynadier 2004, New Hampshire Division of Forests and Lands and Society for the Protection of New Hampshire Forests (SPNHF) 1997, Flatebo et al. 1999). Field visits by the interdisciplinary team identified wet seep areas and/or vernal pools in or adjacent to Stands 2-16, 2-19, 2-24, 2-30, 2-34d, 2-35b, 2-45, 2-59, 2-63, 3-16a, 2-35a, 4-15, and 4-34 (field notes in project file).

Bear-clawed Beech Trees: Black bear forage in a variety of habitats throughout the year, feeding on green vegetation in the spring, berries and insects in summer, and hard mast (acorns and beechnuts) in fall (Rogers and Allen 1987). Concentrations of bear-clawed beech are an important habitat feature for black bear and other species that rely on

Scars from bear claws indicate use of this beech tree as a food source for black bear. Beechnuts provide high-quality food for bears and other wildlife species.

hard mast as a high-quality food source. Bear-clawed beech trees are known in Stands 2-35a, 2-45, and 4-34, and likely in other stands proposed for harvest as well.

Deer Wintering Habitat: The State of New Hampshire recommends managing deer wintering habitat by interspersing mature softwoods with small openings to perpetuate critical softwood cover, maintain high quality browse production, and ensure deer mobility throughout an area during the harsh winter months (Reay et al. 1990, NH and SPNHF 1997). There is one documented deeryard in the project area with a history of use that seems to be declining since recorded observations in the 1970s (field notes in compartment record and project file). Some wintering activity may occur in the riparian area of Mill Brook adjacent to Stand 2-19 which is in the deer wintering area.

Bats: Several woodland bat species have been recorded across the White Mountain national Forest during bat surveys in the early 1990s and 2000s (Krusic et al. 1996, Sasse 1995, Chenger 2002 and 2004). White-Nose Syndrome (WNS) is a new condition recently found in northeast bats. WNS potentially could affect woodland bat species that do occur in the project area. Bat species that may forage or roost in or near the Mill Brook project area that have been affected by WNS in New York and Vermont include little brown bat, northern long eared bat, and eastern pipistrelle. These bat species commonly roost in trees (most often snags and partially dead trees near foraging habitat) or buildings.

Little Brown Bat

Affected bats may have a white fungus on their noses and occasionally other hairless parts of their bodies including arms, wings and ears <www.necaveconservancy.org/files/wns_3-30-08.pdf>. The exact cause of WNS is still being investigated, but has been associated with high mortality rates at some sites. WNS was first identified in 2006 and has since been confirmed in hibernating bats in New York, Vermont, Connecticut and Massachusetts. WNS has been detected in Indiana bats, little brown bats, northern long eared bats, small-footed myotis and eastern pipistrelles (von Oettingen, personal communication 2008). It is believed the fungi (several genera have been isolated) are a symptom and not the cause of mortality. The Northeast Region of the US Fish and Wildlife Service is maintaining a web site on WNS with some of the most recent scientific information on this syndrome <www.fws.gov/northeast/white_nose.html>.

The vast majority of bats with WNS have been found during the winter in caves where the bats hibernate. No bat hibernacula are known to exist on the WMNF, although there are several small ones throughout New Hampshire. Recent surveys of these hibernacula by two bat experts found no evidence of WNS (von Oettingen personal communication 2008). To date no confirmed cases of WNS have been found on or near the WMNF or anywhere else in New Hampshire or Maine. However, there have been some reports of dead and dying bats in some buildings in New Hampshire this summer. Some bats also have been caught this summer that have white spots, holes, and tears in their wings and there are reports of the bat pups dying. It is not known if this is directly caused by white-nose syndrome that has spread to the State or if these individuals were weakened when they left their winter hibernacula from fighting off WNS and have not been able to recuperate (see above US Fish and Wildlife Service website). At this time, the only recommendations developed by the US Fish

and Wildlife Service and their partners are aimed at preventing the spread of WNS. Efforts focus on human visitation or research in affected hibernacula, human visitation between affected and unaffected caves and mines, and human handling of affected bats. More information may be found at <www.fws.gov/northeast/white_nose.htm>.

Measuring Effects to Wildlife

The relevant elements of wildlife and habitat for the Mill Brook project are:

1. HMU objectives — effects measured by changes in habitat types and age classes.
2. Species/individuals — effects are qualitative expectations based on activity and operating seasons.
3. Habitats of concern — effects measured by changes to habitat or wildlife species.
4. Bats — effects measured by changes to summer roosting habitat and foraging habitat.

Although MIS trends and changes to MIS habitats are noted in this analysis, conclusions regarding timber harvest effects on wildlife habitat are based on Forest-level monitoring of management indicator species. Project level discussions in this document are tiered to the FEIS.

Project activities that could have a measurable effect on one or more of the wildlife elements above are: timber harvest, skidding, prescribed fire, road and landing work, and watershed restoration. Any activity that uses heavy equipment could affect wildlife.

Direct and Indirect Effects

T**he Analysis Area for direct and indirect effects on wildlife** is the project area because timber harvest and other proposed activities would have some immediate effects on wildlife species and habitat conditions, but these are limited to where the activity would occur.

The temporal scope for direct and indirect effects on wildlife is the duration of active timber harvest operations and other proposed actions because this is when wildlife species and habitat would be affected.

Alternative 1

There would be no direct or indirect effects to wildlife species or habitat as no timber harvest or other actions would occur that would cause openings in the forest canopy, tree removal, residual tree damage, snow or soil compaction, or noise from heavy equipment. The goals of promoting diverse wildlife habitat would not be met. There would be no direct or indirect effects to habitats of concern (vernal pools/seeps, bear-clawed beech, or the Mill Brook deer wintering area) or to summer roosting habitat for bats. There would be a lost opportunity to increase foraging habitat for bats by creating forest openings and opening up roads.

Wildlife Habitat: Only natural processes would influence changes in existing habitat conditions. Forest openings would result from mortality of individual trees or disturbance from some other natural event (storm, fire, infestation, etc.). The project area would continue to provide a mix of mature northern hardwood and mature spruce-fir and mixedwood. The patches of mature aspen-birch in some of the stands proposed for harvest would start to die out. Without timber harvest, there would be more

large-diameter cavity trees and accumulation of downed woody material for wildlife habitat.

This alternative would not make progress toward the desired condition in the Mill Brook HMU for northern hardwood regeneration age class; increase the amount of spruce-fir; or maintain an aspen-birch component in stands where there currently is aspen-birch. In addition, there would be a lost opportunity to increase the quality of permanent wildlife opening habitat. We would not be able to provide wildlife habitat diversity in managed lands as identified in the Forest Plan. Alternative 1 would not meet the Purpose and Need and would not meet the Forest Plan goals of providing habitat diversity for wildlife (USDA Forest Service 2005a pp.1-20 and 1-21). Alternative 1 would result in an adverse indirect effect due to declining habitat diversity.

Management Indicator Species: This alternative would favor wildlife species associated with mature northern hardwoods, mixedwood, and spruce-fir, including MIS such as scarlet tanager and blackburnian warble. Without regeneration forest habitat created by the proposed clearcuts, species that favor aspen-birch and regeneration forest habitat such as chestnut-sided warbler, magnolia warbler, and ruffed grouse (MIS for these forest types) might start to decline in the project area.

Transportation: No roads, landings, or skid trails would be built or restored and no roads would be decommissioned. There would be no change to public access to the project area and no effects to wildlife from increased human presence.

Watershed Restoration: Without the watershed restoration projects, the potential for increased erosion of the roads into the stream would increase and waterflows would not be restored to more natural conditions. Over time the habitat quality of instream habitat might be lowered for macroinvertebrates and other aquatic species such as amphibians and fish.

Alternatives 2 and 3

Effects to Species/Individuals

Active timber harvest operations and connected and other proposed actions could have direct effects to wildlife species. Negative effects would include disturbing or displacing wildlife such as nesting birds, or altering travel corridors and mobility of some species such as amphibians and mammals. Beneficial effects would be additional browse and hiding places for wildlife from residual limbs and treetops left on site after logging.

There is some potential for disturbance to a pair of nesting northern goshawks near Stands 2-24, 2-34b, and 2-34e. Restrictions on harvest operations would minimize direct and indirect effects to this nesting pair (see Design Features section 2.5).

Forest openings created by even-aged regeneration harvests and permanent wildlife openings would benefit species favoring open habitats and displace species favoring mature habitats. These areas would have hotter and drier conditions for 2-4 years after harvest (Fay et al 1994). Some amphibians (such as red-backed salamanders) would not survive (DeMaynadier and Hunter 1998). Some amphibians and small mammals would be more vulnerable to predation. Forest Plan requirements for reserve areas in clearcuts would provide some protection to vulnerable species (USDA Forest Service 2005a pp. 2-35 and 2-36).

The five acres of overstory removal in Stand 3-16a under Alternative 2 would release dense softwood understory and increase young spruce-fir forest habitat. This would favor species associated with dense softwood cover such as snowshoe hare (DeGraaf et al. 2006).

Increased browse and soft mast (berries) in clearcuts and permanent wildlife openings would attract species within a few years after harvest. Insects, small mammals, and certain species of birds would likely increase, and mammals such as fox, white-tailed deer, black bear, and moose would inhabit these areas for all or part of the year (Costello et al. 2000, Fuller and DeStefano 2003, King et al. 2001, Thompson III et al. 2001).

Operating Seasons: Breeding, rearing young, feeding, and winter survival are critical phases for wildlife that could be affected by project activities, with individuals potentially suffering disturbance or mortality any time of year. Summer harvest could affect breeding birds and ground-dwelling mammals, amphibians, and reptiles that use trees for nesting, cover, and foraging. Fall harvest could affect autumn breeding species and species such as black bear and small ground-dwelling mammals that feed on acorns and beechnuts. Winter harvest could affect breeding owls as well as white-tailed deer seeking cover in lowland conifers. Species using cavities, such as chickadees and nuthatches; or species which den, such as squirrels and raccoons, could be affected if roost or cavity trees were harvested. Raptors start to breed in February and March, with young fledging in June and July (NH Division of Forest and Lands and SPNHF 1997), so they could be affected by both winter and summer harvest.

Permanent Wildlife Opening Maintenance: The proposed prescribed burns, stumping, and mowing would occur outside of bird nesting season but would temporarily disturb or displace species occupying these sites. Direct effects of prescribed fire in the wildlife openings vary for different species and conditions (Anderson 1994). While there is evidence of vertebrate mortality reported, the most common opinion is that vertebrates are rarely killed in fires (Lyon et al. 1978). The loss of understory vegetation would be temporary, as herbaceous and shrubby vegetation would grow back quickly (Schlossberg and King 2007).

Wildlife Habitat

Habitat diversity would be enhanced as even-aged regeneration harvests increase the horizontal patchiness of the forest. Partial cuts (all but clearcut, patch cut, and overstory removal)would create disturbance, open the canopy to partial sunlight, and release the understory. While stands would still be favored by species requiring mature habitat, increased understory vegetation would offer more nesting habitat for birds, hiding cover for wildlife, and browse for wildlife that forage on young saplings or soft mast such as raspberries. It is expected that this greater diversity would increase the number of species using the forest (DeGraaf et al. 2006).

Data regarding acres of existing and desired habitat types and ages classes in the Mill Brook HMU is in the Wildlife Report in the project file. That analysis indicates that creating regeneration age class in all habitat types, and additional acres of opening habitat would meet wildlife habitat goals. Alternatives 2 and 3 would partially meet the goal by creating 47 acres of northern hardwood regeneration age class, and expanding permanent wildlife openings. Alternative 2 would create more PWO habitat than Alternative 3 (see Table 2).

Management Indicator Species: Wildlife species favoring regeneration habitat such as chestnut-sided warblers (MIS) would benefit from clearcuts. Partial cuts would favor wildlife species associated with mature habitat. Harvesting as proposed in either Alternative 2 or 3 would leave abundant mature habitat in this HMU for species that require it, such as scarlet tanagers and blackburnian warblers (MIS). See the Wildlife Report in the project file for acres remaining in mature habitat.

Habitats of Concern: Known vernal pools and seeps would be protected during project activities (see Section 2.5), however unidentified areas could be affected. Ruts and excessive slash in or near vernal pools and seeps could change hydrologic characteristics causing them to dry up, interfere with migration of amphibians to vernal pools, or increase siltation. Breeding habitat for some species of amphibians could be reduced, as well as the habitat quality for wildlife and plants (Flatebo et al. 1999).

Bear-clawed beech trees will be reserved where possible to minimize impacts to fall foraging habitat. Fall foraging habitat also is available in the abundant mature beech in the Mill Brook HMU outside of proposed harvest areas, so no measurable effects to this habitat are anticipated.

There would be minimal to no direct effects on white-tailed deer as few deer have been observed wintering in this area in recent years, however deer may be attracted to harvested areas to feed on tree tops and limbs. Indirect effects of timber harvest would be increased browse from regeneration of trees, shrubs, and herbaceous plants. The proposed harvest in Stand 2-19 would stimulate softwood regeneration, possibly providing winter cover for deer in the future.

Bats: Proposed summer/fall harvests under Alternatives 2 or 3 for the Mill Brook project could disturb individuals bats if they were occupying a roost tree that was cut. Winter harvests would not disturb roosting bats as they would have left the Forest for their winter hibernacula (usually a cave or old mine site). Harvest during any season could remove suitable roost trees.

Under Alternative 2, approximately 80% (832 acres) of the proposed harvest could occur in the summer/fall season and under Alternative 3, approximately 95% (689 acres) of the proposed harvest could occur in the summer/fall season. Despite this potential for summer or fall harvest, the likelihood of disturbance of individual bats and loss of summer bat roosting habitat from timber harvest proposed under either althernative is minimal for several reasons. First, most of the common woodland bats that summer roost in trees prefer to use snags (Sasse 1995). Forest Plan Standards and Guidelines to protect snags and retain wildlife trees (USDA Forest Service 2005a pp. 2-35 to 2-36) minimize the potential loss of roost habitat (USFWS 2005). Secondly, approximately 90% of the area proposed for harvest under either alternative has an uneven-aged or intermediate harvests where only 20-30% of the mature trees would be cut. This would leave 70-80% of the mature trees in a stand unharvested and available as roosting habitat. Third, only about 10% of the MA 2.1 lands in the Mill Brook HMU are proposed for harvest at this time, leaving a large area of mature habitat available as bat roosting habitat. Upon completion of harvesting, the residual stands (except those proposed for clearcuts and wildlife opening expansion), as well as the surrounding forest in the HMU would retain adequate numbers of live and dead trees that could provide roosting habitat for bats. Finally, bats oftentimes select roost sites in open areas that receive ample solar radiation (Sasse 1995). Some bat species rely on solar radiation to help keep warm (e.g. bats are often found in home attics or in snags

in openings where they are exposed to direct sunlight for much of the day). Much of the forest habitat proposed for harvest in the Mill Brook project area has a closed canopy and would not provide suitable roosting habitat sites for bats seeking a site that is exposed to the sun.

Some of the treatments proposed under both alternatives (clearcuts, expanding and maintaining permanent wildlife openings, and maintenance of roads and landings) would benefit woodland bats by providing an additional food sources and exposing more suitable roosting sites. Research on the White Mountain national Forest found that bats often forage near water bodies, trails, roads, and forest openings (Krusic et al 1996), presumably because insect prey may be more abundant in open habitats and maneuvering in the air is easier.

Transportation System: Human presence in the project area would increase during harvest activities. Species could be disturbed or displaced when roads, skid trails, and landings are being constructed and used. Use of roads, skid trails, and landings in winter could increase mobility for some species on snow compacted by heavy equipment. This benefit could offset some of the disturbance from the presence of people and heavy equipment. Decommissioning 2.4 miles of roads under Alternatives 2 and 3 may decrease human presence slightly in the project area as these roads slowly revert to a vegetated state.

Watershed Restoration: Large pieces of down wood in the riparian area may benefit some wildlife species by providing denning habitat and cover.

Cumulative Effects

See Map 7 and Section 3.1 for location and projects considered in the following cumulative effects analysis.

The Analysis Area for cumulative effects on Wildlife is the same as described for Timber Resources: the Mill Brook HMU, the South Pond HMU, private inholdings, and adjacent private lands, as described in Section 3.11). The rationale is the same, but with an additional focus on how the project would contribute to the habitat objectives for the HMU and the Forest as a whole.

The temporal scope for cumulative effects on Wildlife is ten years in the past and ten years in the future. This timeframe captures the cycle of regeneration age habitat (0-9 years), one of the HMU habitat objectives. Benefits of regeneration habitat begin to diminish for certain wildlife species, such as chestnut-sided warbler and magnolia warbler (MIS) after 10 years, so 10 years in the past and 10 years in the future is an appropriate temporal scope for this cumulative effects analysis area.

Refer to Section 3.1 for past, present, and reasonably foreseeable future projects in the Mill Brook HMU, the South Pond HMU, and adjacent private lands.

Table 6 in the Wildlife Report (project file) provides additional details about whether or how each alternative will meet habitat goals for each of the habitats associated with management indicator species in the cumulative effects area.

Alternative 1

Mature northern hardwoods, spruce-fir, and aspen-birch would continue to dominate the area, with just 1-2% of the MA 2.1 lands in regeneration habitat. Mature habitat intermixed with patches of regeneration is present on the adjacent private lands in the Towns of Stark and Northumberland. Without the proposed timber harvest, habitat diversity would not be enhanced with regeneration harvests, additional acres of permanent wildlife openings, or increased softwood habitat. Dead and dying trees or other small groups of trees may continue to fall and open small areas of the forest floor to sunlight and regeneration. Regeneration forest habitat types such aspen-birch would begin converting to northern hardwoods or softwood types.

Planned harvests in the South Pond HMU and on adjacent private land will diversify wildlife habitat in the analysis area, but meeting the Forest wildlife habitat goals in the Mill Brook HMU would be foregone.

Over time, interior forest dwelling species would be expected to increase in numbers in the Mill Brook HMU. Timber harvest in the South Pond HMU and on adjacent private lands would provide some forest regeneration habitat. Most of the land throughout the HMUs would remain as mature habitat.

Species associated with aspen-birch, including ruffed grouse, and species associated with forest regeneration habitat including chestnut-sided warbler and magnolia warbler would decline in the Mill Brook and South Pond HMUs.

The one existing permanent wildlife opening in the Mill Brook HMU and the seven existing managed permanent wildlife openings in South Pond HMU would continue to be maintained every 3 to 5 years with prescribed fire or mechanical treatments. There would be no cumulative effects of prescribed fire and mechanical treatments on wildlife as there would be no change from existing condition.

Past, present, and future timber harvest in the South Pond and Mill Brook HMUs would follow Forest Plan Standard and Guidelines to protect unique habitat features such as vernal pools, seeps, bear-clawed beech, and deer wintering areas. Timber harvest operations, and associated landing and road construction, on private lands may have some effects on vernal pools and seeps, bear clawed beech and deer wintering habitat. There would be no cumulative effects to summer roosting habitat because there would be no direct and indirect effects from this alternative. The lost opportunity to increase foraging habitat by creating forest openings and opening up roads would perpetuate the current level of foraging habitat in the analysis area.

Transportation: The transportation corridor that has been established over the years to facilitate timber harvesting on national forest and private lands may have resulted in some increased human presence to the area, which may have affected wildlife movements.

Ongoing maintenance of trails, backcountry recreation facilities, and the South Pond recreation area in the cumulative effects analysis area would have minimal effects on wildlife as existing habitat conditions would not change.

Watershed Restoration: Implementation of the watershed project in the South Pond HMU would restore watershed conditions in the North Kilkenny project area, but the opportunity to restore watershed conditions in the Mill Brook watershed would be lost. Less denning habitat and cover would be created. See Fish and Aquatic Habitat section.

Alternatives 2 and 3

Wildlife Habitat

Mature northern hardwoods, mixedwood, spruce-fir, and aspen-birch would continue to dominate the analysis area, however some of the objectives for providing wildlife habitat diversity, including establishing regeneration forest habitat, maintaining aspen-birch, expanding and creating highly ranked existing permanent wildlife openings and favoring spruce-fir on softwood sites would be met. Harvesting on adjacent private lands has resulted in increased regeneration forest habitat in the past ten years but most of the forested habitat in these areas likely still remains in young or mature age class.

Effects of the transportation system and maintenance of recreation facilities would be the same as described under Alternative 1.

Implementation of the watershed projects in Mill Brook and the South Pond HMU would restore watershed conditions in the North Kilkenny project area and the Mill Brook watershed. These projects would provide benefits to species associated with riparian and aquatic habitat (see Section 3.3). Wildlife species that favor riparian habitat are described in DeGraaf et al. 2006, page 78 and 145.

Effects of creating northern hardwood regeneration

There are 96 acres of existing northern hardwood regeneration and a desired future condition of 194-258 acres in the Mill Brook HMU, with Alternatives 2 and 3 proposing to create 47 acres.

There are 75 acres of existing northern hardwood regeneration and a desired future condition of 192-256 acres in the South Pond HMU, with 81 acres approved in the North Kilkenny analysis. There may be some additional timber harvesting in the South Pond HMU in the next ten years, but the amount and locations are unknown.

In addition to national forest timber harvesting, about 2,111 acres of private land were heavily cleared in the Towns of Stark and Northumberland since 1996 (total acreage of the towns is 62,000 acres).

The increased amount of northern hardwood regeneration habitat in the Mill Brook and South Pond HMUs will benefit chestnut-sided warblers and move the landscape closer to the HMU and Forest-wide habitat goals. Regeneration habitat on private land in the Towns of Stark and Northumberland is approximately 3 and 4% (calculations based in information from Sundquist personal communication 2007). Less than 1% of the Forest is in regeneration age class at this time, with the goal being 3-4% (USDA Forest Service 2005a, p 1-21).

Approximately 150 species will use northern hardwood regeneration habitat for all or part of their life cycle (DeGraaf and Yamasaki 2001, DeGraaf et al 2006, p. 100 plus Appendices), including chestnut-side warbler. This habitat type is ephemeral on the landscape and favored by a certain suite of species for approximately ten years (DeGraaf and Yamasaki 2001, p. 101).

Chestnut-sided warblers would increase in regeneration harvest areas with the proposed, planned, and recent harvests. Forest-wide bird surveys and Regional breeding bird survey data indicate chestnut-sided warblers are declining (USDA Forest Service 2005b, pp. 3-170 and 3-171). Breeding bird survey data collected in the project

area also showed a downward trend of chestnut-sided warblers (unpublished WMNF data 1992-2004). The proposed increase in regeneration age hardwood habitat at the project scale would not be dramatic enough to change population trends at a landscape scale, but might help slow the decline.

Effects of creating aspen-birch regeneration age class and maintaining this habitat type

The Forest goal is to maintain the current level of aspen-birch habitat, which is about 5% (USDA Forest Service 2005a, p 1-21). None of the existing 856 acres of aspen-birch habitat type in the Mill Brook HMU would be regenerated under Alternatives 2 and 3, although Stands 2-34e and 2-35b have small aspen-birch inclusions that would likely be regenerated and possibly managed as aspen-birch habitat in the future. The North Kilkenny project will regenerate 18 acres of the existing 892 acres of aspen-birch in the South Pond HMU. The aspen-birch habitat that is not proposed for regeneration would continue to decline in quality and other tree species would begin to dominate. Overall, the goal of maintaining current levels would not be met in these HMUs. Although the amount of aspen-birch habitat on private lands is unknown, it is assumed that it exists and that some of it will be maintained through the recent heavy clearing. Data from Coos County showed that 10% of the timberland was aspen-birch type in 1997 (Frieswyk and Widmann 2000).

Aspen-birch provides valuable habitat: the high stem densities of aspen-birch regeneration provide protection for many species while mature aspen-birch buds and catkins are an important food source (DeGraaf et al. 2006, p. 95). Early-successional aspen and paper birch is used by approximately 150 wildlife species while approximately 125 wildlife species use mature aspen-birch for all or part of their life cycle (DeGraaf and Yamasaki 2001, DeGraaf et al. 2006 p. 94 plus Appendices).

Breeding bird survey from the Forest show no trends in ruffed grouse numbers, however regional bird surveys show a decline in the region to the north of the Forest and an increase to the south (USDA Forest Service 2005b, p. 3-174). Breeding bird survey data collected in the project area recorded ruffed grouse during most years but showed no trends (unpublished WMNF data 1992-2004). With limited regeneration acres created by past, proposed, and future activities, this habitat type will decline in the analysis area over time, as will species favoring it, such as ruffed grouse.

Effects of uneven-aged treatments on mature spruce-fir, northern hardwood, and mixedwood.

Over the long-term, uneven-aged or intermediate treatments would maintain the mature character and most of the existing habitat types of the treated stands. However, some of the harvest prescriptions on softwood ELTs would promote spruce-fir where northern hardwoods, aspen-birch, and mixedwood forests currently dominate.

About 2,600 acres of MA 2.1 lands in the Mill Brook HMU have an ecological capability (ELT) for spruce-fir. There are currently 710 acres of spruce-fir forest, with management proposed to increase this: Alternative 2 would convert 350 acres over time, and Alternative 3 would convert 300 acres. These acres represent the stands proposed for harvest with uneven-aged prescriptions that are currently not spruce-fir stands but have a softwood ELT. In the South Pond HMU, there is an ecological capability for 2,600 acres of MA 2.1 lands to be spruce-fir and only 2,100 are currently spruce-fir. Planned harvest will convert 21 acres of mixedwood to spruce-fir over time. Increasing

spruce-fir would contribute to the long-term HMU goals to have a mix of habitat types that more closely reflects land capability.

The Forest habitat objective is to have approximately 80% of northern hardwood and 95% of spruce-fir in mature age class (USDA Forest Service 2005a, p. 2-21, USDA Forest Service 2005b, p. 3-85). After the proposed and planned harvests both HMUs would have 80% of northern hardwoods in mature age class. The Mill Brook HMU would have 99% of spruce-fir in the mature age class, and the South Pond HMU would have 80% of spruce-fir in the mature age class.

Wildlife species preferring mature northern hardwoods, mixedwood, and spruce-fir would be favored by these uneven-aged treatments. Up to 150 species of wildlife will use mature northern hardwoods or mixedwood for all or part of their life cycle including scarlet tanager and 125 species will use mature spruce-fir including blackburnian warbler (DeGraaf and Yamasaki 2001, DeGraaf et al. 2006, p. 100 plus Appendices).

Population trends have been stable for scarlet tanagers on and adjacent to the Forest over the past four decades with populations declining in some years and increasing in others (USDA Forest Service 2005b, p. 3-172.). Breeding bird survey data collected in the project area showed scarlet tanager numbers to be stable and blackburnian warbler numbers increasing slightly between 1992 and 2004 (unpublished WMNF data 1992-2004). Breeding bird surveys from the Forest and Region indicate that blackburnian warbler populations are stable. There is some evidence that numbers may be declining south and increasing to the north (USDA Forest Service 2005b, p. 3-173). Scarlet tanager and blackburnian warbler numbers will likely remain stable because a majority of the habitat in the cumulative effects analysis area will remain mature.

Effects of overstory removal to move mature spruce-fir to young spruce-fir

The five acres of overstory removal in Stand 3-16a under Alternative 2 would release dense softwood understory and increase young spruce-fir forest habitat. This harvest would not occur with Alternative 3 so no young spruce-fir forest would be created. There would be no increase in young spruce-fir in the South Pond HMU. It is assumed that a percentage of the harvest on adjacent private lands also would increase young spruce-fir after removing the spruce-fir overstory. Overstory removal treatments in spruce-fir would favor species associated with dense softwood undergrowth. Upon completion of the proposed and planned harvest less than 1% of young spruce-fir in the Mill Brook HMU would be young spruce-fir forest, and approximately 12% of the South Pond HMU would continue to provide this habitat. Forest- wide approximately 2% of the Forest is young spruce-fir forest. The Forest objective is approximately 3-6% (USDA Forest Service 2005a, p. 2-21, USDA Forest Service 2005b p. 3-85), so Alternative 2 would promote a increase in young spruce-fir, progressing slightly toward the desired habitat condition. Past harvest in the Towns of Stark and Northumberland have likely increased the component of young spruce-fir on private lands.

Up to 100 species of wildlife will use young softwoods for all or part of their life cycle (DeGraaf and Yamasaki 2001, DeGraaf et al. 2006, p. 113 plus Appendices) including snowshoe hare and magnolia warbler.

Population trends have been stable for magnolia warbler on and adjacent to the Forest (USDA Forest Service 2005b p. 3-172) but like the scarlet tanager there have been some years where populations declined and other years where populations increased. Breeding bird survey data collected in the project area showed slight increases and

decreases in magnolia warbler numbers between 1992 and 2004 (unpublished WMNF data 1992-2004). Magnolia warbler wold gain habitat from the overstory removal treatments in the Mill brook HMU and on adjacent private lands. The five acres of habitat provided by Alternative 2 probably is not enough to affect population trends in the analysis area; whether enough habitat will be created on private lands to affect populations is unknown.

Effects of expanding and creating permanent wildlife openings

There is one managed permanent wildlife opening in the Mill Brook HMU and seven managed permanent wildlife openings in the South Pond HMU. While there is open habitat on adjacent private land, there are no known managed permanent wildlife openings. Expanding permanent wildlife openings would provide higher quality habitat because studies show that early successional birds favor larger openings (Schlossberg and King 2007). Maintenance activities would increase the percentage of grass, forbs, and soft mast such as blueberries providing a source of browse, hiding cover, and nesting habitat for some species of wildlife. Research has found that a wide variety of wildlife species are associated with these areas for all or part of their life cycle including chestnut-sided warblers (Chandler C. 2006, Chandler R. 2006, DeGraaf et al. 2006, pp. 131-136 plus Appendices). This effect also would be similar for three permanent wildlife opening expansions in the South Pond HMU. These openings would continue to be maintained every 3 to 5 years with prescribed fire or mechanical treatments. The effects of prescribed fire on wildlife are the same as under direct and indirect effects because no additional prescribed fire is reasonably foreseeable in the analysis area.

Habitats of Concern

Springs and Vernal Pools: Ruts and excessive slash in or near unidentified vernal pools and springs could change hydrologic characteristics causing them to dry up, interfere with migration of amphibians to vernal pools, or increase siltation (Flatebo et al. 1999). Any vernal pools and springs identified in the Mill Brook project area and future harvests would be protected by Forest Plan standards and guidelines (USDA Forest Service, 2005a, pp. 2-24 through 2-26).

Bear-clawed Beech Trees: Loss of bear-clawed beech trees from past, present and future timber harvests throughout the analysis area is certain, but the abundant mature northern hardwoods and mixedwood in the Mill Brook and South Pond HMUs will continue to provide hard mast for wildlife, including black bear. While the degree of loss on private lands is unknown, project design features on national forest lands would reserve bear-clawed beech trees where possible and promote future mast-bearers.

Deer Wintering Habitat: The 2005 Forest Plan contains guidelines that would ensure that deer wintering habitat is maintained Forest-wide (USDA Forest Service, 2005a p. 2-34). Any individual tree and group selection harvests in softwood and mixedwood habitat on private lands in the cumulative effects area would enhance deer wintering habitat. However, even-aged harvest in softwood or mixedwood on private lands could diminish the amount of wintering habitat available to white-tailed deer. Group selection harvest is emphasized in deer wintering areas on the Forest to provide cover intermixed with pockets of browse. As a result, harvest proposed in Alternative 2 in the deer yard would not add to any negative effects that might occur on private land.

All other connected actions, other proposed activities, and ongoing maintenance activities in the analysis area would not affect habitats of concern.

Bats: Past, present, and reasonably foreseeable future timber harvest in the cumulative effects analysis area is described in Section 3.1. As described under direct and indirect effects, timber harvest could disturb individual bats that summer roost in trees, could cause a loss of potential summer roosting habitat, and could result in an increase in foraging habitat where openings are created or roads are opened up. The potential for disturbance of individual bats or loss of potential summer roosting habitat from timber harvest in the cumulative effects analysis area would be minimal for the following reasons:

- Protection of snags and wildlife trees in harvest units (there may be a greater loss of potential roost trees on private lands as harvest activities may not follow the same guidelines to reserve snags and wildlife trees);
- Bats seek summer roost sites in more open habitat that has ample solar radiation and most of the proposed harvest units are in closed canopy forest;
- A large portion of mature trees are left in harvest units with intermediate or uneven-aged harvests that are or could provide summer roost habitat for bats especially if an area has been opened up by timber harvest; and
- Only small fraction of the Mill Brook and South Pond HMUs as well as the forest on private land are harvested at one time.

Based on this level of harvest, the cumulative effects of timber harvest to bats in the analysis area would be similar to the direct and indirect effects. There could be some disturbance of bats who summer roost in trees, loss of roosting habitat, and an increase in foraging habitat in openings or where roads are opened up. However, the potential for disturbance of individual bats or loss of summer roosting habitat from timber harvest would be minimal for the same reasons discussed under direct and indirect effects. Please see the discussion of direct and indirect effects above.

There is potential that WNS might spread to the White Mountain National Forest in the near future. Currently there is some evidence of sick bats in southern New Hampshire, although it has not been confirmed that WNS is the cause. Given the limited potential for impacts to roosting bats and large amount of roosting and foraging habitat that will remain in the area, cumulative effects from this project should not substantially impact any bat species. There are many unknowns about WNS, although more is being learned every day. The White Mountain National Forest is very concerned about White-Nose Syndrome in bats. We are in close communication with the USFWS, who is the lead agency for WNS because of the potential effects to federally listed bats elsewhere. The USFWS is working in close cooperation with the States and many university and research laboratories to identify the cause and possible mechanisms in which WNS may be spread. The White Mountain National Forest will follow the lead of the USFWS and take appropriate action as needed. Currently, it is difficult to predict what the potential threats might be to bat populations on the White Mountain National Forest and impossible to take action to limit the spread of this disease except at hibernacula.

3.15 Federal Threatened, Endangered & Proposed Species and Regional Forester Sensitive Species

The following analysis summarizes the information contained in the report entitled "Non-Native Invasive Species And Wildlife Report And Summary Of Biological Evaluation For Federally Endangered, Threatened, and Proposed Species and Regional Forester Sensitive Species for the Mill Brook Project" as well as the "Biological Evaluation of the Mill Brook Vegetation Management Project" completed by the District Wildlife Biologist. The Report is located in the project file along with all supporting documentation and data used in this analysis.

Affected Environment

A Biological Evaluation (BE) for Federally Threatened, Endangered, and Proposed Species (TEPS), and Regional Forester Sensitive Species (RFSS) was completed on January 2, 2008 for the Proposed Action and its alternatives (BE, project file). The process used and the sources examined to determine potential occurrence of TEPS or RFSS presence are listed in the BE. The Forest Plan uses the best available science to evaluate TEPS/RFSS species and species viability. Information gathered during the species viability analysis was used in updating the WMNF RFSS list (USDA Forest Service 2006b). The BE for this project tiers to and incorporates by reference information on species viability (USDA Forest Service 2005b, Appendix F; USDA Forest Service 2005d) and TEPS/RFSS species used during Forest Plan revision including the Biological Evaluation of the White Mountain National Forest Land and Resource Management Plan Revision (USDA Forest Service 2005b, Appendix G).

General habitat condition of the project area was determined using data and other documentation from past field examinations as well as additional recent field visits while planning the Mill Brook project. See supporting information in the project file.

No TEPS plants were found during a 2005 botany survey of most of the roads and stands in the project area, as well as permanent wildlife openings. Based on a review of all available information, it is the Forest Service Biologist's determination that potential habitat may occur in the project area for one federally threatened species and eight Regional Forester Sensitive Species:

Federally Threatened Species:

1) Canada Lynx (Lynx canadensis)

Regional Forester Sensitive Species:

1) Eastern small-footed myotis (Myotis leibii)
2) Northern bog lemming (Synaptomys borealis sphagnicola)
3) American peregrine falcon (Falco peregrinus)
4) Brown's Ameletus Mayfly (Ameletus browni) Species
5) Third Ameletus Mayfly (Ameletus tertius)
6) Bailey's sedge (Carex baileyi)
7) Broad-leaved twayblade (Listera convallarioides))
8) Heartleaf Twayblade (Listera cordata))

Direct and Indirect Effects

The Analysis Area for direct and indirect effects on TEP/RFSS is the project area, since the impact of the Proposed Action and its alternatives on TEPS/RFSS is dependent on the presence of individuals and/or specific habitat where the activity occurs. The temporal scope for direct and indirect effects on TEPS/RFSS is the duration of active harvest operations and other proposed activities because this is when TEPS/RFSS species would most likely be affected.

There are no federally listed bats occurring on the White Mountain National Forest so there would be no direct or indirect effects to federally listed bats from the Action Alternatives. The BE details direct and indirect effects to TEP/RFSS species or their habitat that may occur in the project area. There would be no direct or indirect effects from Alternative 1. Under Alternatives 2 and 3, a Canada lynx could be temporarily displaced by active harvesting operations but this is unlikely as the potential for a Canada lynx to be in the project area is very low. Designated lynx habitat would be maintained or enhanced under Alternatives 2 and 3. There may be minimal direct and/or indirect effects to eastern small-footed myotis foraging and roosting habitat. Currently white-nose syndrome (WNS) is not considered a major threat to eastern small-footed myotis as this syndrome is not known to occur in New Hampshire or Maine. There is potential that WNS might spread to the White Mountain National Forest within the next ten years. It is unlikely that proposed activities that harvest trees (e.g., those proposed in the Mill Brook project) would result in cumulative effects to eastern small-footed myotis as literature indicates that this species does not favor roosting in trees during the non-hibernation season (Kiser et al. 2001, 2002, Veilleux 2005, 2006, 2007). Treatments that open up forested habitat or maintain travel corridors would maintain or enhance foraging habitat for eastern small-footed myotis. Alternative 2 creates more openings than Alternative 3. There is a slight potential for the Action Alternatives to displace a northern bog lemming, although the potential for presence of this species in the project area is low. There would be no direct effect to peregrine falcons as there are no active eyries in the project area. The combination of clearcuts and expansion of a permanent wildlife opening may diversify the prey base for peregrines foraging in the area with Alternative 2 creating more openings than Alternative 3. There may be some minimal direct effects to Brown's and third ameletus mayfly habitat from sedimentation into streams during active harvesting operations and watershed improvement projects under both Action Alternatives. No-harvest buffer zones along streams would minimize this effect. The potential for presence of Bailey's sedge, broad-leaved, and heartleaf twayblade is low. There is potential for some direct and in direct effects to these from timber harvest, skid trail layout, and watershed improvement projects that occur in the summer and fall season. These activities could eliminate some individuals if they were present. Alternative 2 would disturb the most habitat. No-harvest buffers along streams and the exclusion of most springs from harvest areas and skid trails would minimize the potential for these effects to individuals or habitat. In the long term, habitat would be maintained or enhanced for Bailey's sedge as it favors disturbed habitat.

Cumulative Effects

See Map 7 and Section 3.1 for location and projects considered in the following cumulative effects analysis.

The Analysis Area for cumulative effects for TEPS/RFSS species except Canada lynx encompasses National Forest lands within the Mill Brook HMU and the South Pond HMU, the private inholdings in both HMUs and adjacent private land in the Towns of Stark and Northumberland. This encompasses approximately 76,000 acres including 17,000 acres in the Mill Brook HMU, 16,000 acres in the South Pond HMU, 1,700 acres of private inholdings in the Mill Brook and South Pond HMUs, and approximately 41,000 acres of private lands acres in the Towns of Stark and Northumberland to the north and east of the Mill Brook and South Pond HMUs. This area was chosen because 1) the habitat objectives for the Mill Brook HMU provide a measurable assessment of how the Proposed Action and its alternatives contribute to the habitat objectives of the White Mountain National Forest, as defined in the 2005 Forest Plan (USDA Forest Service 2005a), 2) it takes into account an approved North Kilkenny Vegetation Management Project in an adjacent South Pond HMU and, 3) it considers activities on private lands that are adjacent to the Project Area.

The Analysis Area for Canada lynx is Lynx Analysis Unit (LAU) 1, which is the analysis unit that includes all of the Kilkenny Unit of the White Mountain National Forest (approximately 72, 000 acres).

Effects Determination and Rationale — Federally Threatened Species

The USFWS responded to the scoping letter for the Mill Brook vegetation project on January 31, 2008 (Letter in Project File). They concurred that the threatened Canada lynx may be present in the project area and that the proposed vegetation management activities will not adversely affect the Canada Lynx because there is no information to indicate that the lynx presently resides in the vicinity of the project area.

Canada Lynx

All alternatives ***may affect but would not likely adversely affect individual Canada lynx or associated habitat***.

Rationale:

1) Based on the recent documented presence of lynx on the northern part of the Forest and the availability of suitable habitat, it is assumed that Canada lynx could occur in the project area. Potential is low, however, due to the relative few sightings of lynx on the Forest in the past few decades (USDA Forest Service 2005b, Appendix G, p. 69; USDA Forest Service 2006c, d).
2) Alternatives 2 and 3 could directly affect a Canada lynx by disturbing an individual during active harvest operations or connected actions (road and landing construction and reconstruction and prescribed fire) and activities associated with implementing the proposed watershed projects. These effects would be of short duration.
3) Under Alternative 1 (No Action) there would be no opportunity to increase suitable habitat by increasing a component of young spruce-fir in the area.
4) In the short term designated suitable lynx habitat would be maintained or slightly increased and denning habitat would be maintained on more than 10% of LAU 1 under both Action Alternatives. In the long term northern hardwood habitat on sites with a softwood tendency would be managed to move these sites towards spruce-fir habitat. These treatments would adhere to lynx habitat standards and guidelines in the Forest Plan (USDA Forest Service 2005a, p. 2-14; USDA Forest Service 2003).

5) Road restoration would not affect Canada lynx habitat as roads that were barricaded prior to the project would be barricaded and closed again upon completion of the project. (USDA Forest Service 2005a, p, 2-16, USDA Forest Service 2003).

Effects Determination and Rationale — Regional Forester Sensitive Species (RFSS)

Eastern small-footed myotis

Alternative 1 (No Action) ***would have no impact on eastern small-footed myotis***. Alternatives 2 and 3 ***may impact individual eastern small-footed myotis, but would not likely cause a trend toward federal listing or loss of viability***.

Rationale:

1) Most literature indicates that eastern small-footed myotis roost in or under rocks on hillsides and open ridges, in cracks and crevices in rocky outcrops and on talus slopes, as well as in buildings (USDA Forest Service 2005b, Appendix G, pp. 224-227). The likelihood that individual bats are roosting in trees in Project Area is considered low.
2) The implementation of Forest Plan Standards and Guidelines (USDA Forest Service 2005a, pp. 1-20 and 1-21, 2-24 through 2-26 and 2-33 through 2-36) to maintain a diversity of habitat conditions well distributed across the Forest, reserve large wildlife trees, retain standing dead trees where possible, and maintain riparian habitats in areas managed for vegetation should ensure that adequate habitat is maintained for eastern small-footed myotis.
3) Currently White-Nose Syndrome is not considered a major threat to eastern small-footed myotis as it does not occur on the Forest. There is potential that WNS could spread WMNF over the next ten years. Proposed activities that harvest trees in the Mill Brook project area would not result in cumulative effects to eastern small-footed myotis as the literature indicates that this species prefers to roost in rocky outcrops and talus slopes duirng the non-hibernation season. Moreover, some of the proposed harvests that enhance foraging habitat (clearcuts, expanding and maintaining permanent wildlife openings, and restoration of roads and landings) would benefit eastern small footed myotis by providing an additional food source.

Northern Bog Lemming

Alternative 1 (No Action) ***would have no impact on northern bog lemming***. Alternatives 2 and 3 ***may impact individual northern bog lemmings, but would not likely cause a trend to federal listing or loss of viability***.

Rationale:

1) Northern bog lemmings are extremely rare in New England. The likelihood of an individual occurring in the Project Area or cumulative effects analysis area is considered low.
2) Identifiable riparian habitat or wet areas are usually excluded from harvest units minimizing the risk of disturbing an individual animal or associated habitat.

3) The implementation of Forest Plan Standards and Guidelines (USDA Forest Service 2005a, pp. 1-20 and 1-21, 2-24 to 2-26 and 2-33 to 2-34) to maintain a diversity of habitat conditions well distributed across the Forest and maintain riparian habitats in areas managed for vegetation in areas managed for vegetation should ensure that adequate habitat is maintained for northern bog lemming.
4) State guidelines provide sustainable management recommendations to private landowners managing their lands for timber (NH Division of Forests and Lands and SPNHF 1997). These guidelines should provide protection for wetlands on private lands for habitat that might be used by northern bog lemming.

American Peregrine Falcon

Alternative 1 (No Action) ***would have no impact on American peregrine falcon***. Alternatives 2 and 3 ***may have a beneficial impact on individual peregrine falcons by diversifying the prey base in the area***.

Rationale:

1) There are no cliff sites within the Project Area therefore proposed activities would not impact nesting sites.
2) The implementation of Forest Plan Standards and Guidelines (USDA Forest Service 2005a, pp. 1-20 and 21 and 2-33 to 2-34) to maintain a diversity of habitat conditions well distributed across the Forest may increase availability of different types of prey for this species over time and ensure that a suitable prey base is available for falcons. Some types of harvest on private land also might diversify the prey base for this species.
3) Occupied eyries have increased on or near Forest lands in New Hampshire over the past few years and have successfully fledged young.

Brown's Ameletid Mayfly and Third Ameletid Mayfly

Alternative 1 (No Action) ***would have no impact on Brown's ameletid mayfly or third ameletid mayfly***. Alternatives 2 and 3 ***may impact individual Brown's ameletid mayfly and third ameletid mayfly but would not likely cause a trend to federal listing or loss of viability***.

Rationale:

1) *Ameletus tertius* has been recorded in the perennial streams of the Mill Brook watershed. *Ameletus browni* may occur in the perennial streams of the Mill Brook watershed.
2) The implementation of Forest Plan standards and guidelines (USDA Forest Service 2005a, pp. 2-24 to 2-26, and 2-33 to 2-34) protects perennial streams from increased sedimentation by maintaining a 25-foot no-harvest buffer and a wider Riparian Management Zone with limited harvest. (USDA Forest Service 2005a, G-1 and G-2, pp 2-24 to 2-25).

3) Stabilizing the segments of Mill Brook identified as in need of watershed improvements would minimize the chance of future sedimentation in the Mill Brook, providing a long term benefit to instream habitat.

Bailey's sedge

Alternative 1 (No Action) ***would have no impact on Bailey's sedge***. Alternatives 2 and 3 ***may impact individual plants of Bailey's sedge but would not likely cause a trend to federal listing or loss of viability***.

Rationale:

1) There are three records of Bailey's sedge on the Forest, (two historic and one current). None of these locations are near the Project Area. The likelihood of this species occurring in the Project Area is low. Plant surveys did not identify this species in the Project Area.
2) There is a risk that unidentified individuals could be disturbed during active harvest operations and implementation of the watershed restoration projects.
3) The implementation of Forest Plan standards and guidelines will maintain a diversity of habitats (USDA Forest Service 2005a, pp. 2-20 and 2-21 and 2-33 to 2-34) and protect wetlands (USDA Forest Service 2005a pp. 2-24 to 2-26). Roadside ditches, log landings, and wildlife openings would continue to provide suitable habitat for this species.
4) The State of New Hampshire also provides guidelines to private landowners to protect streams and riparian areas during active timber harvesting (NH Division of Forests and Lands and SPNHF 1997).

Broad-leaved Twayblade and Heartleaf Twayblade

Alternative 1 (No Action) ***would have no impact on broad-leaved twayblade and heartleaf twayblade.*** Alternatives 2 and 3 ***may impact individual plants of broad-leaved twayblade and heartleaf twayblade but would not likely cause a trend to federal listing or loss of viability***.

Rationale:

1) The likelihood of these species occurring in the Project Area is low. The Project Area was searched by qualified individuals at an appropriate time of year to identify this species. No individuals were located. Small pockets of habitat may occur in the Project Area.
2) There is a risk that unidentified individuals could be disturbed during active harvest operations and implementation of the watershed restoration projects.
3) Identifiable wet seepy areas are usually excluded from harvest units minimizing the risk of disturbing individual plants or associated habitat.
4) Forest Plan Standards and Guidelines protect streams and riparian areas (USDA Forest Service 2005a pp. 2-24 to 2-26).
5) The State of New Hampshire provides guidelines to private landowners to protect streams and riparian areas during active timber harvesting (NH Division of Forests and Lands and SPNHF 1997.)

Chapter 4: Preparation and Consultation

Interdisciplinary Team Members and Forest Service Contacts

The following individuals participated in development of the proposed action, connected actions, and other proposed activities and all alternatives, and the subsequent analysis necessary to prepare the environmental assessment.

Interdisciplinary Team (IDT):

Katherine Stuart..... District Ranger
Steve Bumps..... Forester, IDT Leader
Lesley Rowse..... District Wildlife Biologist
Jeffrey Williams ..... Assistant District Ranger – Forest Management
Robert A. Colter..... Forest Soil Scientist
Livia Crowley..... Forest Hydrologist
Dave Neely ..... Assistant District Ranger- Recreation
Mark Prout ..... Forest Fisheries Biologist
Pat Nasta..... District NEPA Coordinator, Writer/Editor

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Karl Roenke ..... Forest Archeologist
Reginald Gilbert ..... District Timber Sale Administrator
Randy Harrington ..... District Forest Technician
Jay Milot ..... Forest Fisheries Technician
Chris O'Brien ..... District Heritage Paraprofessional
Robert Mengel ..... District GIS Coordinator
Jon Jakubos ..... Forest Engineering Technician
Ken Allen..... Forest Landscape Architect
Richard Dow ..... Print/Internet Design

Other Agencies and Individuals Contacted for Professional and Technical Assistance

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Michael J. Amaral,
S. von Oettigen,
William J. Neidermyer..... US Fish and Wildlife Service

Christine Perron..... Botanist

D. Sundquist..... Society for the Protection of New Hampshire Forests

Selectmen..... Towns of Stark and Milan

Town Clerks ..... Northumberland, Stark, and Milan Town Offices

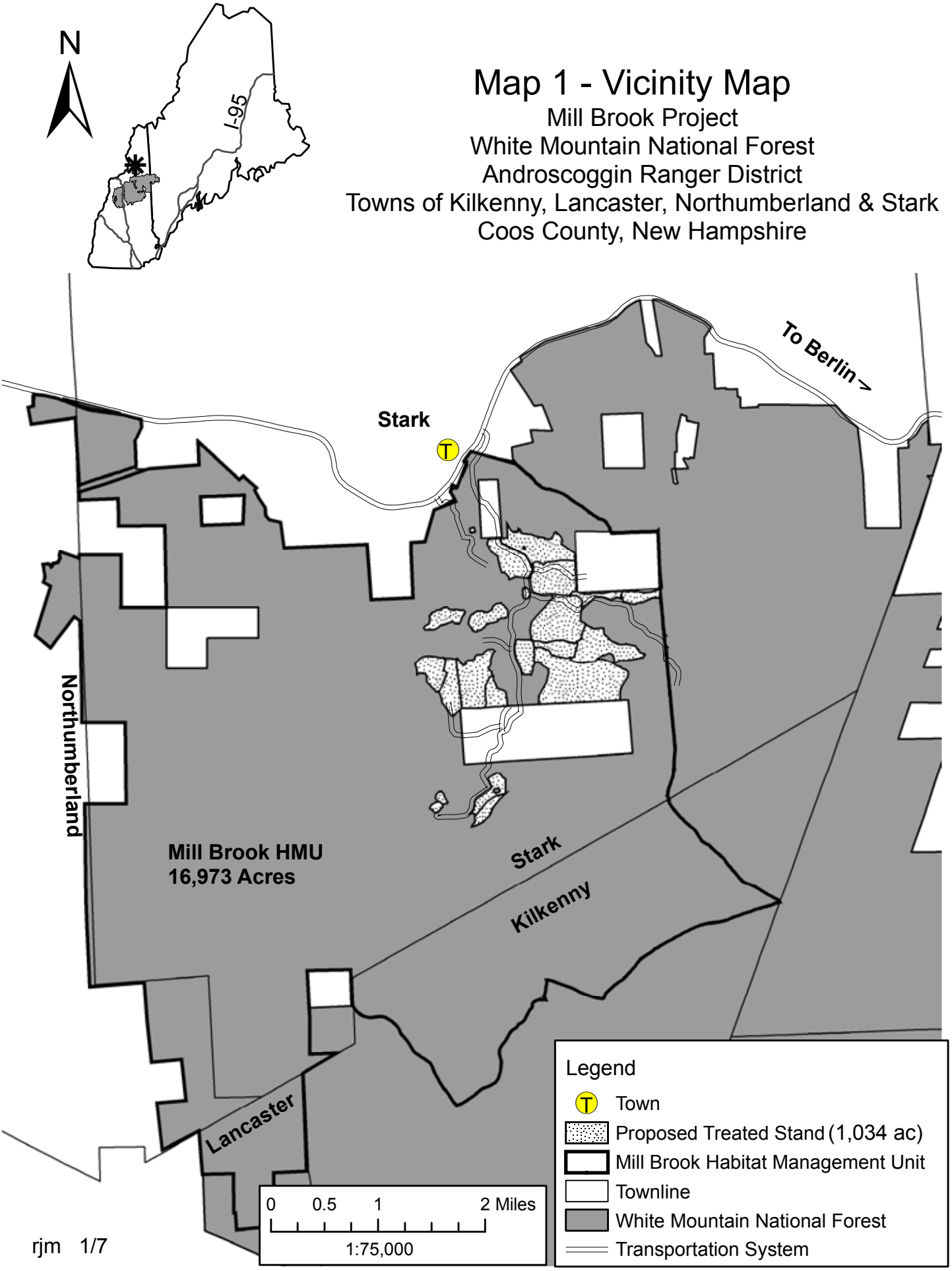
D. Szczublewski. ..... NH Dept. of Transportation

C. Costello..... USDA Bartlett Experimental Forest – NE Research Station.
Saint Lawrence and Atlantic Railroad

Appendix A: Maps

Map 1 - Vicinity Map

Mill Brook Project
White Mountain National Forest
Androscoggin Ranger District
Towns of Kilkenny, Lancaster, Northumberland & Stark
Coos County, New Hampshire



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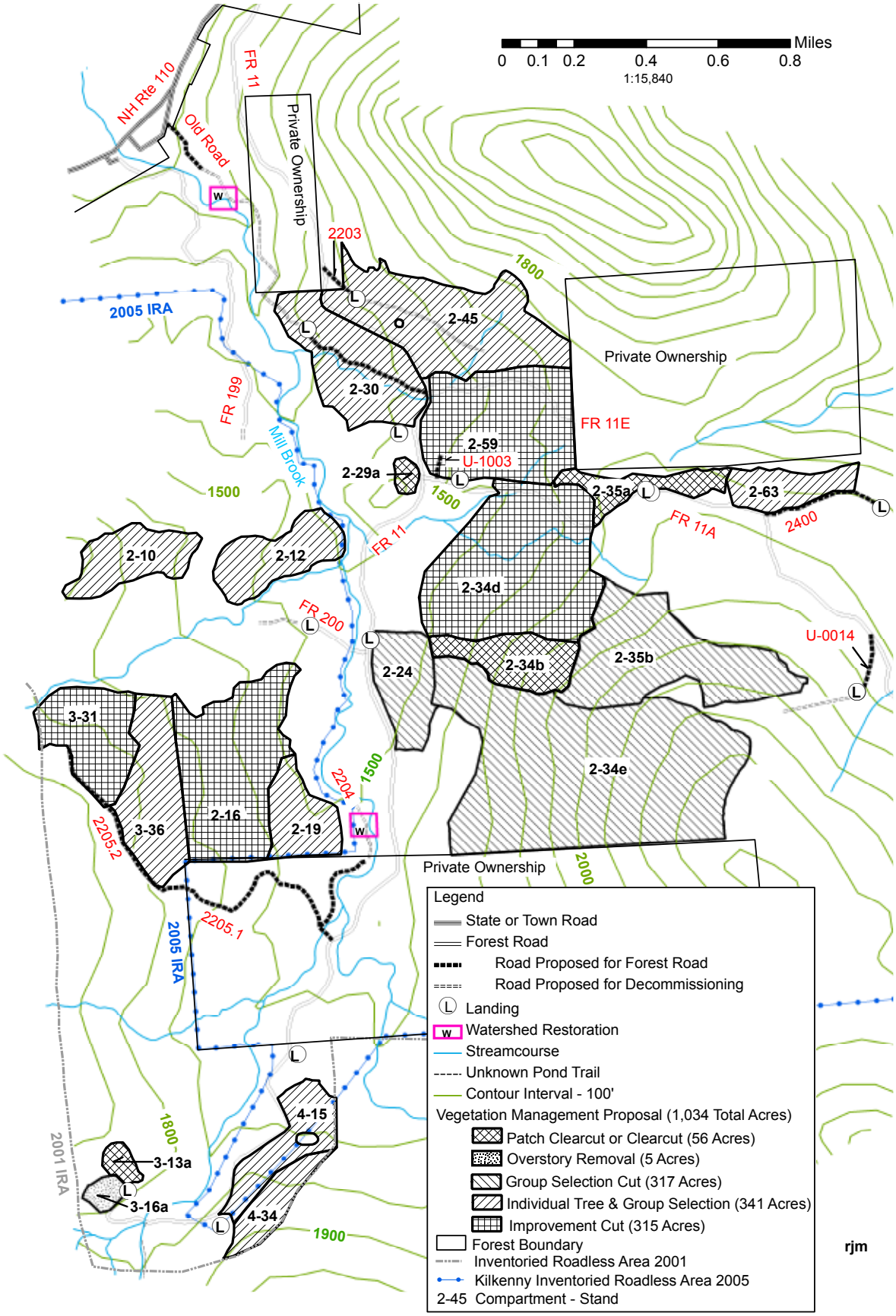
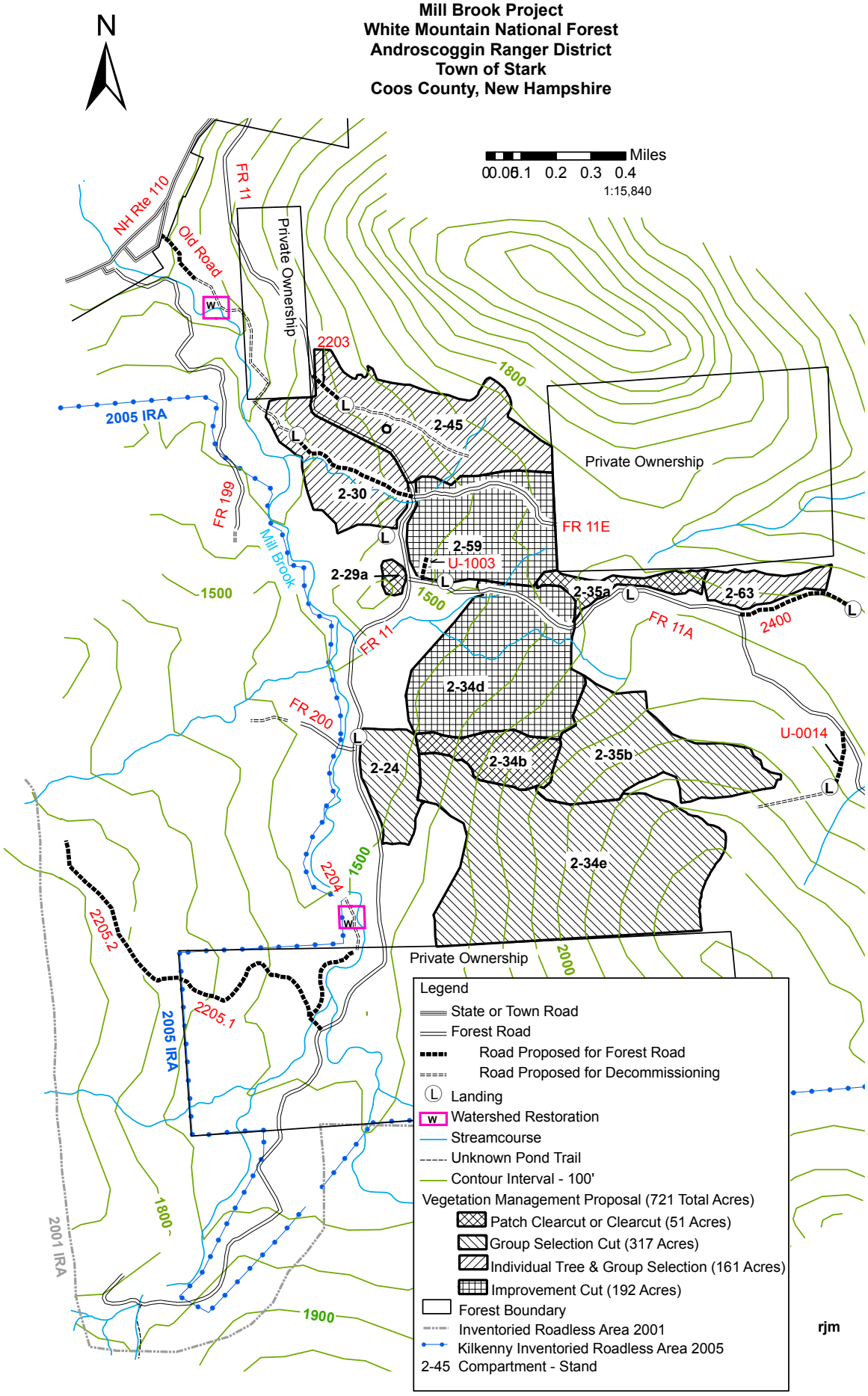
Map 2 - Alternative 2

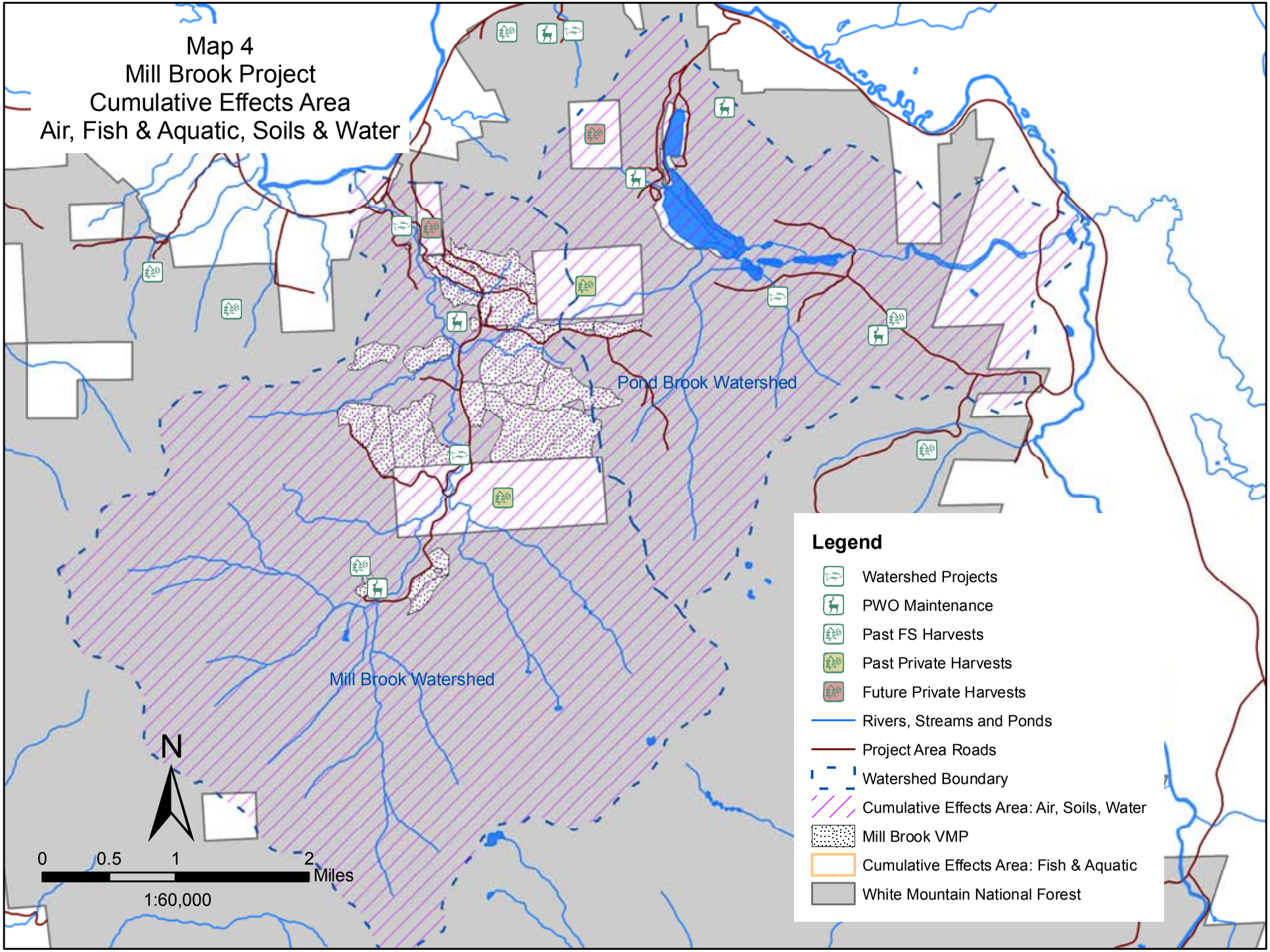
Mill Brook Project
White Mountain National Forest
Androscoggin Ranger District
Town of Stark
Coos County, New Hampshire

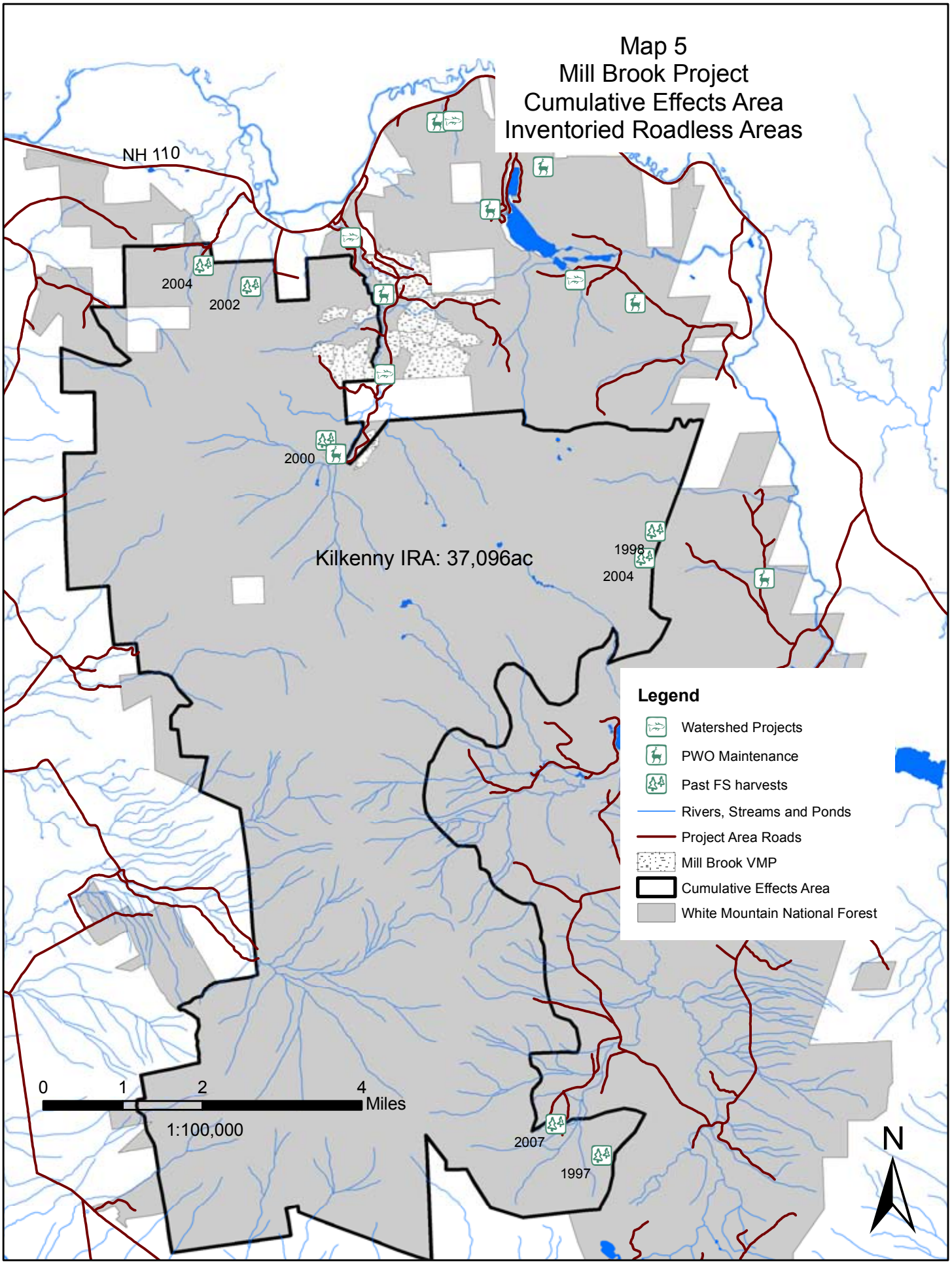


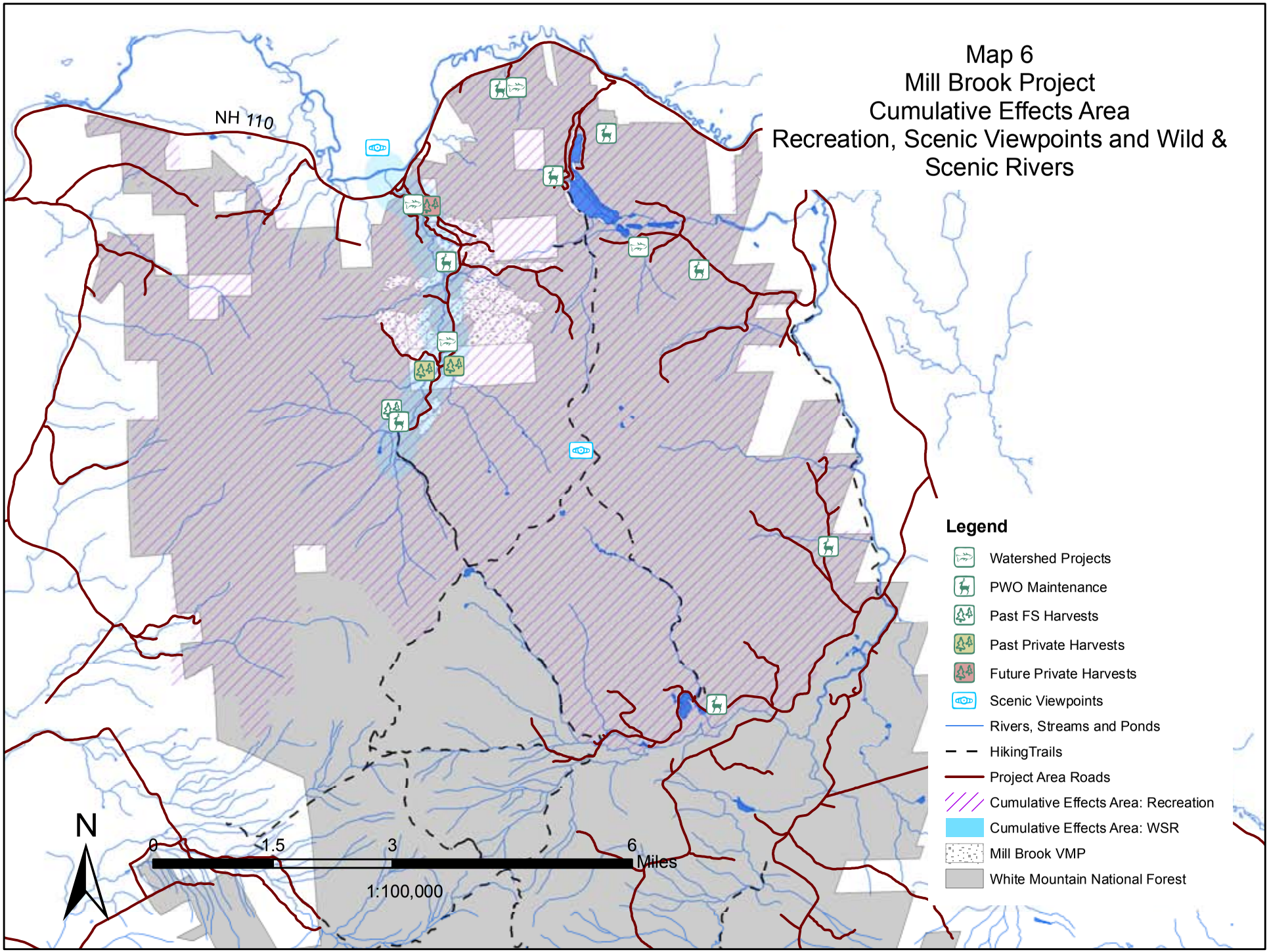
Map 3 - Alternative 3

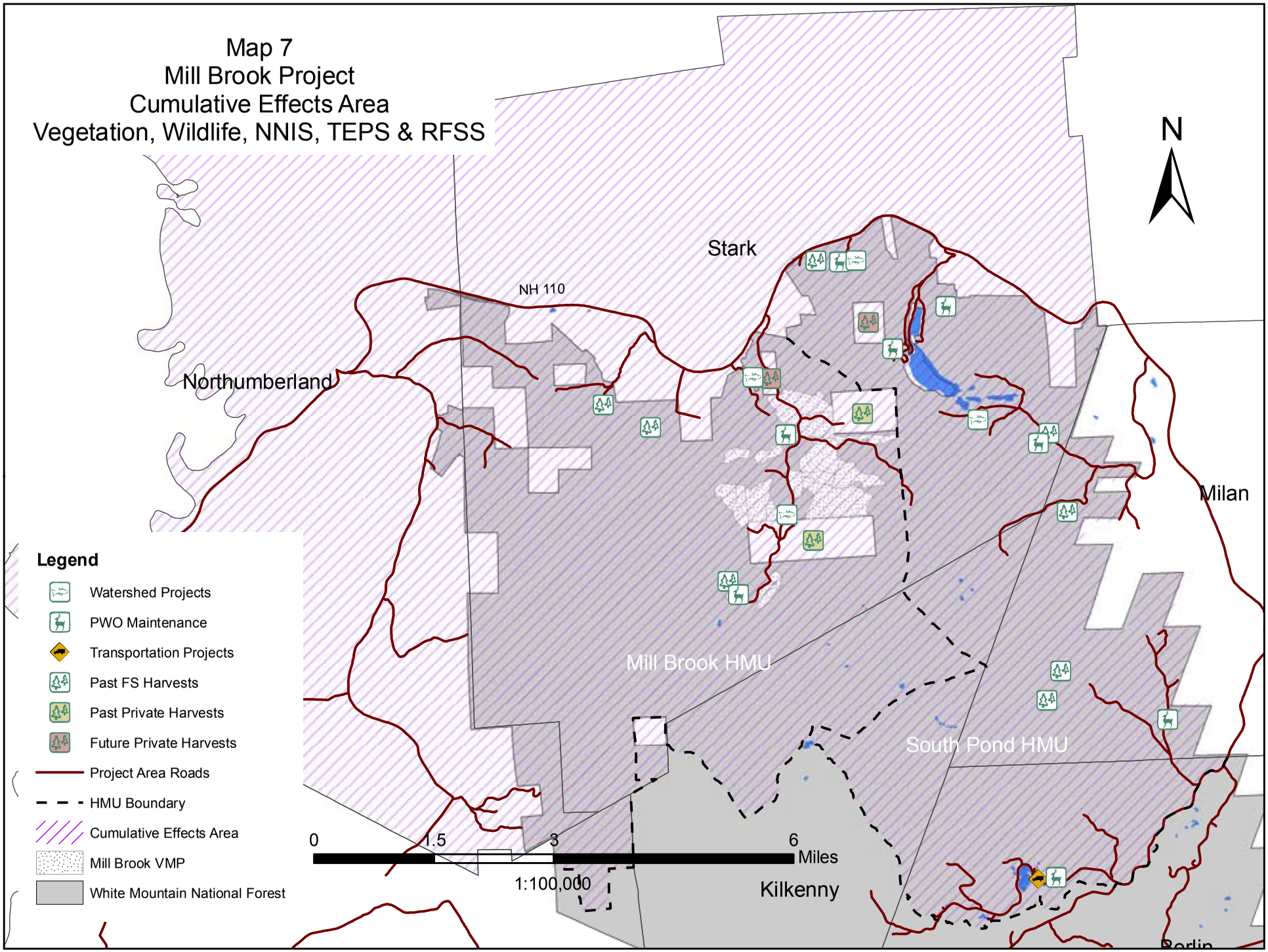
Mill Brook Project
White Mountain National Forest
Androscoggin Ranger District
Town of Stark
Coos County, New Hampshire




Map 4
Mill Brook Project
Cumulative Effects Area
Air, Fish & Aquatic, Soils & Water
Pond Brook Watershed
Mill Brook Watershed
N
0
0.5
1
2
Miles
1:60,000
Legend
Watershed Projects
PWO Maintenance
Past FS Harvests
Past Private Harvests
Future Private Harvests
Rivers, Streams and Ponds
Project Area Roads
Watershed Boundary
Cumulative Effects Area: Air, Soils, Water
Mill Brook VMP
Cumulative Effects Area: Fish & Aquatic
White Mountain National Forest


Map 5
Mill Brook Project
Cumulative Effects Area
Inventoried Roadless Areas
NH 110
2004
2002
2000
Kilkenny IRA: 37,096ac
1998
2004
2007
1997
Legend
Watershed Projects
PWO Maintenance
Past FS harvests
Rivers, Streams and Ponds
Project Area Roads
Mill Brook VMP
Cumulative Effects Area
White Mountain National Forest
0
1
2
4
Miles
1:100,000
N


Map 6
Mill Brook Project
Cumulative Effects Area
Recreation, Scenic Viewpoints and Wild & Scenic Rivers
NH 110
Legend
Watershed Projects
PWO Maintenance
Past FS Harvests
Past Private Harvests
Future Private Harvests
Scenic Viewpoints
Rivers, Streams and Ponds
HikingTrails
Project Area Roads
Cumulative Effects Area: Recreation
Cumulative Effects Area: WSR
Mill Brook VMP
White Mountain National Forest
N
0
1.5
3
6
Miles
1:100,000


Map 7
Mill Brook Project
Cumulative Effects Area
Vegetation, Wildlife, NNIS, TEPS & RFSS
N
Stark
NH 110
Northumberland
Milan
Mill Brook HMU
South Pond HMU
Kilkenny
Legend
Watershed Projects
PWO Maintenance
Transportation Projects
Past FS Harvests
Past Private Harvests
Future Private Harvests
Project Area Roads
HMU Boundary
Cumulative Effects Area
Mill Brook VMP
White Mountain National Forest
0
1.5
3
6
Miles
1:100,000

Appendix B: Scoping Comments and Responses

The process of "scoping" is intended to seek information that will help us refine the proposed action, identify significant issues, develop alternatives that meet the stated Purpose and Need, and otherwise address potential site-specific resource effects. Scoping is usually done early in the environmental analysis.

Each comment received during the scoping period was reviewed to identify issues and concerns related to this project. Comments and questions relevant to the site-specific analysis were considered in detail. They are all listed in this section with a response by the interdisciplinary team and where supporting information can be located in the EA.

Along with their comments that were project-specific and helpful to the analysis, some respondents sent questions, observations, suggestions, and requests for information that were not relevant to this project-level analysis. This latter group of comments did not meet the scoping request for "site specific comments about the Mill Brook Vegetation Management Project, along with supporting information you believe will help me identify issues, develop alternatives, or predict environmental effects of our proposal." Many appeared to be rhetorical or were requests for information at a Forest-wide scale. The comments, questions, and suggestions that did not apply to this project are not responded to in this document. Respondents who have Forest-level questions or concerns should contact the Forest separately on those topics.

We appreciate the time all respondents spent reviewing and commenting on the Mill Brook Project Scoping Report. Thank you for your thoughtful comments.

Where possible in the following discussions, the commenter is quoted directly and in the context of their full comments. All correspondence is filed and available for public inspection in the Mill Brook Project File located at the Androscoggin Ranger Station in Gorham, New Hampshire.

Comments and responses are grouped by category as follows:

1. Project Support
2. Fish and Aquatic Habitats
3. Heritage Resources
4. Inventoried Roadless Areas
5. Lands
6. Non-Native Invasive Species
7. Recreation
8. Scenic Resources
9. Socio-Economic Assessment
10. Soils
11. Transportation System
12. Vegetation
13. Water Resources
14. Eligible Wild and Scenic Rivers
15. Wildlife
    - White-Tailed Deer
    - Permanent Wildlife Openings
    - Fragmentation
    - Cumulative Effects/Harvesting on Private Land
    - Habitat Management Units
    - Wildlife Habitat
    - Viability
16. Federal Threatened, Endangered, and Proposed Species and Regional Forester Sensitive Species and Exemplary Communities
17. General Comments

1. Project Support

Comment: "I believe the proposed logging operations are good for the forest as well as the Coos County economy. Much of the area along Millbrook Road is heavily wooded and would certainly benefit from selective cutting."

Comment: "I am in agreement with the treatments as proposed in the Scoping Report. It is my opinion that the treatments for the stands were chosen only after careful and thoughtful analysis with consideration given to the full range of resource and public values that could be influenced by these proposed actions."

Comment: "The two watershed restoration projects as proposed for Mill Brook are well needed and will serve to eliminate erosion, restore the floodplain and address concerns voiced by residents in the town of Stark. Our fisheries biologist Dianne Emerson accompanied us on the public tour and was in agreement that these efforts will prove beneficial to the aquatic resources of this watershed."

Comment: "Much of the area should have been harvested years ago, which would have added to the local economy and improved the forest as a renewable resource, not as a stagnant wilderness."

Comment: "Coös County wishes to register its support for the Mill Brook Vegetation Management Project and the proposed timber sale with stream improvement project…The County encourages the forest management practices described in this project…The County backs the positive economic effects of harvesting timber. Timber management and harvesting have strong historical importance in the economy of Coös County. Many of the residents of this County depend on the woods industry for their jobs and livelihood. A project such as this one where contractors will be held to the highest harvesting standards is a win-win for the environment and the economy."

Comment: "…called in support of the proposed Mill Brook Vegetation Management Project."

Comment: "The timber harvest plan is viable."

Comment: "I basically agree with the proposed plan."

Comment: "…harvesting of these species is a good idea for these areas, I believe it is necessary for this type of growth in these areas lest they become chocked with dead-fall."

Comment: "…feel that the proposed actions represent sound managements for the areas they involve. I strongly support the projects."

Comment: "Having reviewed your "Scoping Report" … please be advised that I support your proposal 100%."

Comment: A commenter expressed support for the project, as it will increase browsing opportunities for white-tailed deer, (possibly providing greater hunting opportunities).

Comment: "…please allow me to say that you people who work for the Forest Service should be commended for the work that you do or at least try to do. It seems that for every step forward you have to take three steps back. Why the government caters to the tree-hugging/save the wolf fools is beyond me and why so few cost the tax payers so much I'll never know.

Comment: A commenter expressed that the Kilkenny IRA was intended as an analysis tool in the Forest Planning process, and therefore is no longer needed. The same commenter further stated that they felt that none of the proposed project actions would have any effect on the character of IRA or scenic river designations.

Comment: A commenter proposed harvesting timber in the Kilkenny IRA, as proposed in the project, as soon as possible to get the harvest areas into a form of management appropriate to permanent wildlife openings and diverse regeneration.

Comment: A commenter expressed appreciation for the changes made due to court rulings concerning the 2001 Roadless Rule because the commenter feels that it addresses concerns relating to: the view from Roger's Ledge, timber harvesting near the Unknown Pond Trail, remote wetlands and small ponds and the Kilkenny Ridge Trail. The commenter stated that these changes will help maintain the "wilderness feel" from the trails and Roger's ledge.

Comment: "The materials provided suggest that a great deal of time and effort have been invested in designing a project that meets multiple Forest Plan objectives while mitigating negative factors. We commend the project team for their thorough project preparation."

Comment: "…the Mayor and Council of the City of Berlin voted unanimously to indicate their strong support for the Mill Brook Vegetation Management Project which will provide high quality saw timber and other timber products on a sustained yield basis and a balanced mix of habitats for wildlife species.

It is the understanding …that this project is entirely consistent with the recently signed and unappealed Forest Plan for the White Mountain National Forest. Accordingly, they see no reason that this project should not proceed on schedule, and they urge that to happen."

Comment: "The NHTOA is in support of the Mill Brook Vegetation Management Project. This project achieves many goals highlighted in the new Forest Plan including: maintaining early successional and permanent opening habitat, increasing softwood and aspen habitat composition, improving timber resources through the removal of lower quality, individual trees and, or species in improvement cuts, single tree or group selection and other harvesting activities, releasing young and vibrant tree regeneration by removing mature or decadent overstories, providing a sustained yield of high quality saw timber and other round wood products form a renewable resource to help support the New Hampshire economy, improve streams to prevent flooding and improve aquatic and riparian habitat, and improving or maintaining the transportation system on the forest."

Response: Thank you for your comments in support of this project.

Comment: "I can only support the watershed restoration of the Old Road if the Forest Service will not be allowing access off of that road again, ever…its potential future should be finalized..."

Response: As stated in the scoping document released in February, 2007, 0.7 miles of the road is not needed for long term use. Rock barriers in place at the junction of the road and FR 11 have effectively discouraged any off-road use, and more barriers will be placed at the north end of the road. FR 11, FR 199 and the north & south ends

of the Old Road provide all the access needed to this area for long term vegetation management.

2. Fish and Aquatic Habitat

Comment: "I support the efforts to minimize erosive deposition in Mill Brook by watershed restoration along Old Road and along FR 2204. However, simply blocking the road channel might not be enough; it may be easier to clearly define a new side channel capable of handling the increase stream flow and redefining its entrance back into Mill Brook."

Response: Rather than create a new side channel, the restoration project would allow the brook to use the existing side channel while preventing the road from eroding into the brook.

Comment: "While we agree with the effort to keep the stream within its boundaries, we have not seen previous 'treatments" result in verifiable habitat in 50 years that we have been watching."

Response: Rather than trying to keep the stream within its "boundaries," the watershed restoration projects are designed to restore the existing roadbeds into functional floodplains and side channels.

Comment: Comments about the watershed restoration project along the Old Road – although mostly in agreement with the project but offers the advice to proceed cautiously with lowering the rock barrier because it was put there for a reason initially.

Response: The new elevation of the side channel will be determined after a new elevation of the floodplain is determined. The addition of roughness features (wood, boulders) will raise the elevation of the floodplain. The side channel elevation will be lower than the floodplain elevation. These will be determined when the project is laid out on the ground.

Comment: Add wood and rocks to the Old Road to control erosion; don't revegetate because the risk of flooding is too great. If work can be done by hand, existing vegetation and roots will be protected.

Response: By reducing the elevation of the side channel plug, adding roughness features, planting some trees, and mulching bare ground, an improved functioning floodplain can be established quickly. The addition of roughness features (wood, boulders) will slow water velocities and allow fine sediments to accumulate in the floodplain. This may promote some natural revegetation of the area and increase the success rate of planted trees. If a large flood would occur within the first year after project implementation, some plantings could fail. With each year that passes, these plantings would be at less risk from the effect of a large flood, and will restore the compacted roadbed faster than by allowing trees to establish naturally. We believe an attempt to restore the function of the floodplain as fast as possible is the most prudent approach.

3. Heritage Resources

Comment: The commenter states, "We believe that it is vitally important that cultural resources be protected to the fullest extent," and requests information regarding survey methodology and results, mitigation measures planned, buffers around sites,

timetable and evaluation of sites for inclusion on the National Register of Historic Places, potential historic districts, and monitoring during harvest periods.

Response: The affected environment for heritage resources as well as information regarding survey techniques and results are summarized in the EA in Section 3.4 with supporting reports, data, and protective requirements documented in the project file.

4. Inventoried Roadless Areas

Comment: A commenter stated that harvesting timber and reconstructing roads in the Kilkenny IRA violates the 2001 Roadless Area Conservation Rule.

Comment: A commenter asserted that the Forest Service has misinterpreted the recent ruling that reinstates the Roadless Rule, 36 C.F.R. Part 294, by stating that [the] ruling does not apply to new inventories" and overstates the differences between current and previous inventory criteria.

Comment: A commenter stated that the FS should apply the same standards to the 2005 Kilkenny Roadless Area as the National Forest Roadless Lands of 2001. The respondent stated that the revised regional inventory criteria used in the Forest planning process substantially increasing roadless inventory does not justify including newly inventoried roadless areas in timber harvests.

Comment: A commenter asked for clarification and provision of the court ruling that states that the RACR does not apply to new IRAs.

Comment: A commenter asserted that the recently reinstated 2001 Roadless Rule prohibits the type of logging proposed in the Kilkenny IRA, and that the proposed logging should be dropped from roadless areas in all alternatives in the Mill Brook Project. The commenter further stated that none of the road building exceptions apply.

Response: 36 CFR Part 294, Special Areas, Roadless Area Conservation; Final Rule, states in 294.11 Definitions: "Inventoried Roadless Areas: areas identified in a set of inventoried roadless area maps contained in Forest Service Roadless Area Conservation Final Environmental Impact Statement, Volume 2, dated November 2000, which are held at the National headquarters office of the Forest Service." The summary section of the regulations that discussed comments and responses relating to 294.11 Definitions (page 3250) states that, "These maps are maintained at the national headquarters of the Forest Service and are the official maps for the final rule. In the event a modification to correct any clerical, typographical, or other technical error is needed, the change will be made to the national headquarters maps and corrected copies of the maps made available to other administrative units. This definition does not apply to future areas that are to be inventoried for wilderness consideration or other purposes."

None of the Mill Brook project would occur in areas that were included as part of the 2001 Roadless Area Conservation Rule (RACR). The 2001 rule specifically addressed 58,518,000 acres on National Forests nationwide (USDA Forest Service 2000a, Table 3-1, pp. 3-4), of which 241,000 acres (excluding Wilderness) was specifically identified on the White Mountain National Forest. The four-volume FEIS for the 2001 Roadless Area Conservation Rule clearly applies to specific areas on each National Forest, analyzed as shown in FEIS Volume 2 (Maps of IRAs), page 126. An accurate map of the 2001 Roadless Rule boundary in the vicinity of the Mill Brook project is on Map 2 in Appendix A of this EA. As shown on that map, all Mill Brook project activities

are outside of the mapped 2001 roadless area boundary. As stated in the EA, this is consistent with Forest Service Manual Interim Directive 1920-2006-1 which requires that management of lands included in the 2001 RACR inventory be consistent with direction in the Roadless Area Conservation Rule.

All of the proposed projects would occur on MA 2.1 lands, which allows the full array of actions proposed and analyzed in this EA.

Comment: A commenter thought that logging activities in the Mill Brook project will have a significant effect of the wilderness character of the Kilkenny IRA; therefore the project requires an EIS to analyze effects on wilderness character on the portion of the Kilkenny IRA subject to logging and road construction.

Comment: A commenter asserted that the Mill Brook project would have a significant effect on the environment by allowing timber harvesting and road construction within the Kilkenny IRA, therefore requiring an EIS.

Comment: A commenter expressed that the proposed project area would "alter the undeveloped character of an [IRA], by reducing the size of the area that qualifies as roadless both through the acres of harvest and the addition of system roads and requires an EIS.

Response: The EA for the Mill Brook Project, in compliance with FSH 1909.15, Chapter 20.6, clearly demonstrates that the proposed project would not substantially alter the degree to which lands within the Kilkenny IRA meet roadless inventory criteria, nor would the actions substantially alter the degree to which lands within the IRA meet wilderness capability characteristics. Consequently, the EA demonstrates that the Mill Brook project would not substantially alter the undeveloped character of the Kilkenny IRA. In addition, the proposed road reclassifications would result in fewer "system" roads.

One of the intents of the analysis documented in this EA is to determine whether or not the proposed action would result in significant effects; if so, then further analysis would be conducted and documented in an EIS. The EA and supporting documentation in the project file provides sufficient evidence and analysis to evaluate the effects of the proposed action and the alternatives and discloses those effects. The EA did not identify significant effects to the human environment.

Comment: A commenter asserted that the Mill Brook project would have a significant effect on the scenic integrity of the Kilkenny IRA, therefore requiring an EIS.

Response: The EA analyzed the effects of proposed activities on the natural appearance of the IRA as it relates to both inventory criteria and wilderness capability criteria and found that the project would not substantially alter the degree to which lands within the IRA would meet inventory or evaluation criteria as a result of selection of any alternative. Additional information on effects to scenery is available in Section 3.8 of the EA.

Comment: A commenter requested the development of an alternative that included the decommissioning of all roads within the Kilkenny IRA in the vicinity of the Mill Brook Project.

Response: We considered such an alternative but did not analyze it in detail for the reasons stated in Section 1.5.

Comment: A commenter expressed that, since they perceive timber harvesting in an IRA to be "very controversial," they would like to see an alternative that only proposes the watershed restoration component of the project within the Kilkenny IRA.

Response: We could not consider such an alternative in detail in this analysis for the reasons described in Section 1.5.

Comment: A commenter asserted that "roadless logging and road building is very controversial".

Comment: A commenter stated that the FS must view the proposed project in a national and regional context, and that the project will set a precedent for future action and it will be highly controversial.

Response: As described in the EA (Inventoried Roadless Areas, Section 3.5), this action does not set precedence for or direct future management that would limit the area's inclusion in a future roadless inventory or consideration of the Kilkenny IRA for potential wilderness. The EA concludes that there would not be substantial impacts to either roadless inventory criteria or wilderness characteristics resulting from selection of any alternative The analysis of the Mill Brook Project is tiered to the 2005 FEIS (USDA Forest Service 2005b pp. 3-389 to 3-394 and Appendix C-3 to C-7) which clearly presents the scope and context of the Roadless Inventory for Eastern Wilderness. Tiering to the Forest Plan and FEIS, the EA sets the context and clearly demonstrates that the proposed actions will not set precedence for any separate action relative to roadless areas.

"Controversy," in the context of NEPA significance (1502.27), does not equate to public opposition. We examined the scientific basis for the effects disclosed and are not aware of any scientific controversy concerning the potential effects of the action.

The Mill Brook EA contains a thorough analysis of the effects of the project on a variety of resources, including potential effects of logging and road restoration on inventoried roadless areas (EA Section 3.5). Specialists considered all known, relevant science in their analyses (EA Appendix C and project file). They compared the projects and results described in the literature with the level of activity proposed in Mill Brook, the results of local monitoring of similar activities, and existing condition in the Mill Brook area relative to past management. Those comparisons gave them the information needed to evaluate the applicability of the literature findings and to reach their effects determinations. We also considered the opposing views of several public comments in our analysis. Neither the analysis nor the public input on this project identified any controversy as relates to significance of effects on the human environment.

Comment: A commenter expressed that they would prefer an alternative that does not propose harvesting timber in an Inventoried Roadless Area.

Comment: A commenter stated that they would like to see an alternative that does not propose road building, road authorization or timber harvesting in an IRA.

Response: Alternative 3 was developed in response to the public concern regarding timber harvest in the IRA, and as such there is no timber harvest or connected road and landing work proposed in the Kilkenny IRA (see Section 2.3). No road construction is proposed in any alternative.

Comment: A commenter asked about the effect of new forest system roads (completed as elements of the project) on the roadless area calculation of no more than a half-mile of road per 1,000 acres in the Kilkenny IRA.

Response: As described in section 3.5 of the EA, the actions proposed in the Mill Brook project will decrease road mileage in the Kilkenny IRA. There are currently 2.6 miles of Forest Roads in the Kilkenny IRA. The Proposed Action calls for decommissioning .7 miles of Forest Road (FR) 199 and .2 miles of FR 200. The proposal also calls for authorizing .6 miles of FR 2205.2 –which is currently an unauthorized road –as Maintenance Level 1 road. As such, upon completion of the proposed project, there would be 2.3 miles of Forest Roads in the Kilkenny IRA.

Comment: A commenter queried how the 2005 Kilkenny IRA status affects the harvest treatment for stands 2-10, 2-12, 2-16, 2-19, 3-31, and 3-36.

Response: Following wilderness evaluation during the Forest Plan revision process, which ultimately did not recommend wilderness designation for any part of the Kilkenny IRA, the Kilkenny IRA was allocated to MA 2.1, MA 6.1, MA 6.2 and MA 6.3. All stands in the Mill Brook project, including those in the Kilkenny IRA, are in MA 2.1 which allows timber harvest activity. The silvicultural treatment prescribed for each stand is based on many resource concerns including the condition of the stand, soils, and objectives for habitat and timber management. The fact that a stand is in the 2005 Kilkenny IRA does not influence the prescribed harvest treatments.

5. Lands

Comment: The Stark/Kilkenny town line runs somewhat close to the project. That line has not been re-blazed for many years…Perhaps as part of the project that section of internal boundary should be redone.

Response: Although it's clear this would be a beneficial project, the Forest Service responsibility for boundary line maintenance extends to only those lines between Forest Service lands and abutters.

Comment: A commenter requested information about the camps on federal land – whether they are akin to resorts or private residences, and what effects would the proposed project have on these camps and vice versa?

Response: The camps referenced in the scoping report are privately-owned buildings and facilities that existed on the land prior to Forest Service acquisition of the tract in 1988. The use and maintenance of the buildings and facilities are under Special Use Permits authorized by the Act of June 7, 1897, consistent with the Code of Federal Regulations and Forest Service Manual and Handbook direction. Since most of the camps are hunting camps, the benefits to wildlife habitat could enhance the hunting experience of the camp owners. Other effects to camp owners would include log truck traffic on FR 11, noise from harvest operations, and increased human activity in the area while operations are occurring. None of these effects are different than what the camp owners have experienced with recent harvesting on private lands. There would be no effects to the physical settings of the camps.

6. Non-Native Invasive Species (NNIS)

Comment: "In providing for a mix of wildlife species, will any invasive species be introduced (plants as well as animals) or will you hope for expansion into new habitat?"

Response: The goals, objectives, standards, and guidelines of the WMNF Forest Plan are designed to keep the Forest free of non-native invasive species (USDA Forest Service 2005a, pp. 1-7 and 1-8; 2-11 and 2-12).

There are currently no invasive plants of concern in the project area. However, there are numerous infestations on surrounding private land. While the risk is low, there is an increased risk of invasive plants spreading into the project area on heavy equipment or in areas of ground disturbance from existing populations on surrounding land (Section 3.6 of the EA). The timber sale contract includes a provision that the loggers' off-road vehicles, such as skidders, must be cleaned prior to entering the project area (BT6.35). This provision minimizes any risk of introducing NNIS.

There are no invasive vertebrate species known to occur on the Forest (USDA Forest Service 2005b, p. 3-154).

7. Recreation

Comment: A commenter was generally supportive of the proposed project, but was concerned about potential impacts to the Unknown Pond area.

Response: Project activities would be conducted approximately two miles from Unknown Pond; as such, no effects to the area around the pond are expected. The trailhead and a short portion of the Unknown Pond Trail are located in the southern portion of the project area. This trail receives low use. Further, the project will be completed primarily during winter months, such that project work will impact few, if any, hikers. The Recreation analysis in the EA (Section 3.7) details the predicted effects to hikers in the project area.

Comment: A commenter expressed concern about the proposed decommissioning of the "Old Road" between Stark and Mill Brook Road. The commenter stated that this road has been used as a trail by local people and fears that the road will become impassable after the river stabilization methods are completed. The commenter wanted the option of maintaining this section of road for a snowmobile trail in the future.

Response: One of the four goals of the Mill Brook Vegetation Management Project is to manage streams at proper functioning condition to dissipate energy associated with high water flows, thereby decreasing erosion, reducing flood damage, and improving water quality. The watershed restoration components of the project also address local concerns about the potential risk of flood damage to residents of Stark. Foot travel on the Old Road may still continue following implementation of the watershed project, though we recognize that it will become somewhat inconvenient due to the placement of woody debris and roughening of the road surface. This is an example of needing to balance tradeoffs associated with any action. At this time, we feel that resolution of the watershed issues must take priority over the informal recreation use of the corridor.

Additionally, we recognize why it would be desirable to some snowmobilers to have this corridor as an option for future trail development, however, the watershed restoration and flood control values take precedence at this time. Furthermore, the Old

Road's proximity to Mill Brook would likely preclude trail designation because Forest Plan standards and guidelines would require new trail development to occur outside the stream management zone; currently much of the alignment of the Old Road is within this zone.

Some segments of the Old Road would actually be maintained to a higher standard than they are currently. Our roads analysis indicates that the northern 0.1 miles and southern 0.4 miles of the Old Road are needed for long-term management and so will be classified as Forest Roads and maintained for intermittent vehicle use.

Comment: A commenter expressed concern about the possibility of a snowmobile trail being developed on the "Old Road," stating that the snowmobile trail would be illegal and could cause vegetation damage in the project area.

Response: Building a new snowmobile trail is not a part of this project proposal. See the previous comment and response.

Comment: A commenter stated that there should be no motorized travel off the established roads.

Response: The 2005 Forest Plan and current Forest Orders specifically prohibit the use of all terrain vehicles (ATVs) except on designated snowmobile trails in the winter, when the ground surface of such trails is frozen and covered with snow.

Comment: A commenter advised that the closure of the Mount Cabot Trail from Jefferson has increased hiker traffic on the Unknown Pond Trail. The commenter also advised that Mill Brook Road will see increased hiker vehicle traffic and that the parking areas are showing signs of erosion and "forced expansion".

Response: There likely has been some displacement of hiker traffic as a result of the closure of the Mt. Cabot Trail in 1999; however the primary access point for Mt. Cabot since this time has been the Bunnell Notch Trail rather than the Unknown Pond Trail. The pullout that provides parking for the Unknown Pond Trail is not excessively eroded, nor is surface material appearing to move into Mill Brook. As discussed in the Recreation section of the EA, we do not expect the current low-use nature of the trail to increase as a result of any component of the Mill Brook Project.

Comment: A commenter suggested installing watershed improvements such as puncheons and rock placements to prevent erosion, organic matter deposition and seasonal flooding along several brook crossings on the Unknown Pond Trail.

Response: We agree that these tasks would improve resource conditions of the Unknown Pond Trail, and will consider these needs in our overall trail maintenance planning for the WMNF. Trail maintenance priorities are set according to resource protection needs and available funding and are not addressed in this analysis.

Comment: A commenter asserted that the construction of a new "winter road" has the potential to create inconsistencies in the Recreation Opportunity Spectrum.

Response: Construction of a winter road is no longer a component of this proposed action. Proposed road construction was part of the original (March 2006) Mill Brook proposal that included lands in the 2001 Inventoried Roadless Area. That area has been dropped from consideration for proposed activities.

Comment: A commenter queried how recreational uses in the project area will be affected by the proposed action and alternatives, about displacement of any recre-

ational uses and the duration of the displacement, alternative areas for displaced recreational users and affects of increased use on those areas.

Response: The Recreation section of the EA (Section 3.7) addresses effects to recreation use of the area that would result from selection of any alternative.

8. Scenic Resources

Comment: "What effect would logging have in the Mill Brook project area on visual characteristics and views from the trails and scenic highways in the area? Describe the visual environment and any visual concerns camp owners, hikers, bikers, birders, anglers and hunters who use this area for recreation would have?"

Comment: "What effects would the proposed activities have on visual characteristics for the neighbors who can see the habitat changes from their homes, camps and/or businesses? How do these changes compare to Forest Plan standards for visual characteristics? Can Forest Plan VQOs be met under each alternative?"

Response: The proposed activities were fully evaluated from several viewpoints both from within and looking into the project area. There are no views into the project area from NH Route 110, designated in June of 1994 as a Scenic Byway and known as the Woodland Heritage Trail. All alternatives would meet all Forest Plan standards and guidelines for scenery management. For a full effects analysis, please see the Recreation and Scenic Resources sections in chapter 3.

Comment: Previous efforts have resulted in scars across the landscape that we still see – Hubbard Brook for example. We know it will never be the same and those who come after will never know so what does it matter.

Response: The Scenery Management System (USDA Forest Service 2005d) was devised and is applied to protect our outstanding scenery in the White Mountain National Forest. We have many standards and guidelines that serve to protect the scenery in timber harvest areas (USDA Forest Service 2005a Ch. 2 and 3). The Scenic Resources section of the EA describes the scenery analysis and how the timber harvest proposals meet those standards and guidelines for protecting scenic qualities in the Mill Brook area.

Comment: "As a hiker who has enjoyed the view from Roger's Ledge, I was concerned about the view from that location. It seems that will not be changed."

Comment: "…because the proposed logging and road reconstruction will have a significant effect on scenic integrity of the area."

Response: Similar concerns were voiced at a field tour held June 6, 2006. Forest Service personnel were accompanied by two members of the public on July 25, 2006 to Roger's Ledge which overlooks a portion of the project area. The view will essentially remain unchanged. Photos and visual modeling from this viewpoint and several others within and looking into the project area were used to confirm that the project meets Forest Plan Scenery Management Guidelines and will not significantly affect scenic resources (see project file for details). Approximately 3.3 acres (stands 3-13a & 3-16a) of harvesting activity may be observed from Roger's Ledge. It is consistent with evidence of harvesting on surrounding private lands.

9. Socio-economic Assessment

Comment: "I am sick to death of seeing rich lumber barons getting this rake off on nationally owned by taxpayer lands."

Response: One of the goals of management on MA 2.1 lands in the White Mountain National Forest is to provide a sustained yield of high quality forest products to meet society's needs. Timber sales are offered for bid to a wide variety of interested timber purchasers and are ultimately awarded to the highest bidder who can prove financial solvency and competent performance in meeting all of the contract provisions. Our purchasers include large corporations as well as small companies. All employ local citizens, thereby contributing to the economic health of many people at many levels. Section 3.9 provides a more in-depth analysis of socio-economic effects of the proposed action and alternatives.

Comment: "We also guess you are not the robber barons but if this project costs us 1 cent you are abrogating your responsibility to us."

Response: The Socio-economic section of the EA (Section 3.9) describes the costs and revenues associated with the Mill Brook project. Economic feasibility of any project is considered very early in our project planning. Projects that are not economically feasible and/or have no viable funding sources are not developed into proposals for public comment and environmental analysis.

Comment: The commenter requests that the economic effects of timber harvest on the local community be examined — in particular will the local sector benefit from this project, and also what will the negative economic effects be, in particular due to disruptions in recreation use of the area and attendant changes in the revenues accruing locally from such activities? The commenter has numerous questions with respect to the local community ("Stark and nearby communities") and the ability of the "local market" to compete for and utilize wood products from this project.

Response: The socio-economic effects of the Mill Brook project proposals are described in Section 3.9. Quantifiable economic benefits to the Town of Stark are anticipated from NH timber tax revenues and the Forest Service 25% Payment-to-States fund. The cumulative effects analysis includes the Town of Milan for the reasons described in Section 3.9. There are no negative economic effects anticipated to the Towns. There are no outfitter-guides or other revenue-producing recreational activities in the area that would be negatively affected by the Mill Brook project. See section 3.7 for the anticipated effects to recreation.

Forest Service timber sales are offered for bid to a wide variety of interested timber purchasers and are ultimately awarded to the highest bidder who can prove financial solvency and competent performance in meeting all of the contract provisions. Whether these purchasers are "local markets" or not cannot be known prior to bid opening.

There would be additional economic benefits for the Mill Brook project that are difficult to measure at a project level, but it is understood that the proposed projects would contribute to the overall economic health in the area. With respect to the economic impact to the local community, the Coos County Board of Commissioners has this to say about the Mill Brook proposals:

"The County encourages the forest management practices described in this project, and the County backs the positive economic effects of harvesting timber. Timber management and harvesting have strong historical importance in the economy of Coos County. Many residents of the County depend on the woods industry for their jobs and livelihood. A project such as this one where contractors will be held to the highest harvesting standards is a win-win for the environment and for the economy." (Letter in project file.)

In addition, on March 12, 2007, the Mayor and Council of the City of Berlin voted unanimously in strong support for the Mill Brook project, in particular because of the vegetation management goals of providing high quality saw timber and other forest products on a sustained yield basis. (Letter in project file.)

In addition, the Program Director for the New Hampshire Timberland Owners Association wrote in support of the Mill brook project, stating,

"The NH Timber tax and federal stumpage returns provide important income to local governments. The harvest, transportation and secondary manufacturing of the trees within the project area provide jobs to local, regional, and state wide work force. This positive effect is magnified in the local area where this project is found." (Letter in project file.)

Comment: A thorough economic assessment is needed, including costs, multipliers, impact to the economy if the successful bidder is not a local concern, what economic sectors would be affected, and what will be the effects to non-priced values?

Comment: A commenter requested that the economic analysis include the following costs: sale prep, admin, regeneration, site prep, prescribed fire, soil survey and testing costs for road stability, NEPA preparation, and all road costs (construction, reconstruction, road survey, closure, and decommissioning). They state that this information is needed to determine the degree of positive economic benefit. Also, the future funding needs for road maintenance must be disclosed.

Response: The economic effects of the proposed project are described in Section 3.9. The costs and revenues that are relevant and measurable on a project level are included in the consideration of effects.

The activities proposed that could appear to require future funding beyond current levels are maintenance of the permanent wildlife openings and maintenance of the roads re-classified from unauthorized roads to Forest Roads. However, because our goal is to maintain the existing level of permanent wildlife openings across the Forest, we anticipate that while new openings are created, others will be dropped from active management.

10. Soils

Comment: "Efforts to harvest in areas of deep soils, richly organic or peat soils should be minimized or made only during winter deep freeze to facilitate sub-shrub (and others) regeneration."

Response: Soils are protected through the application of New Hampshire Best Management Practices, Forest Plan standards and guidelines, Forest Service Regional soil standards, and timber sale contract provisions. Project-specific design features are assigned (see Section 2.5) to ensure soil productivity is not lost as a result of the

proposed activities. Operating seasons are assigned with the intent of protecting soils and other resources. The project file has supporting data regarding soils types in the project area, and the soils section of the EA describes the predicted effects of the proposed activities on soil erosion, compaction, and soil productivity.

Comment: "I oppose whole tree harvest. It should be limited to …soils with sufficient nutrient concentration and nutrient replenishment capacity…" (plan 2-29) and I don't think that capacity can be demonstrated on these soils."

Response: Whole tree harvest is not proposed for the Mill Brook project.

Comment: "According to table 2, a large portion of the project has harvest restrictions of fall and winter seasons only. Generally soil conditions for operations are more favorable during dry summer conditions then during fall. It would be beneficial to contractors and the stumpage would have more value if a broader season of harvest were permitted. The scoping document gives no reason for these restrictions."

Response: Operating seasons are discussed in the description of Alternative 2 (Section 2.2) and in the vegetation analysis (Section 3.11). Where operating seasons are assigned to protect soils, the appropriate conditions (dry or frozen ground) must exist for active operations. Soils are protected through the application of New Hampshire Best Management Practices, Forest Plan standards and guidelines, Forest Service Regional soil standards, and timber sale contract provisions. Some of the soils in the Mill Brook project area are rocky or wet, requiring winter only harvest. Every effort is made to accommodate summer logging where appropriate.

Comment: "What soil types exist in the Mill Brook Project area? Are these soil types conductive to or capable of supporting the type of regeneration proposed?... What soil types exist on the road beds of the Forest and unauthorized roads in the project area? Are these soil types capable of supporting road use by heavily loaded vehicles?..."

Response: Soil types in the project area are discussed in soils section of the EA, with detailed supporting data about ecological land types (ELTs) in the project file. All the soil types in the active timber areas are capable of supporting the type of regeneration proposed. Monitoring has been conducted in the past on projects of a similar nature with no adverse effects observed (USDA Forest Service 1996). Designated Forest Roads have been designed and maintained, based on the soils present, to support the equipment used on them with compaction and rock where needed. Forest Roads are not under the guidelines of soil productivity. Part of every timber harvest is ensuring that haul roads are in a condition suitable for use by fully-loaded log trucks.

11. Transportation System

Comment: A commenter wants to know specifics on proposed upgrades to Road #2400.

Response: Peps Place Road is officially known as FR 11A.The road the commenter refers to (Road #2400) branches off FR 11A approximately one mile from the Mill Brook Road (FR 11). Upgrades to FR 11A and Road #2400 would include brushing, reshaping and/or resurfacing of the roadbed where needed, clearing ditches, curve widening, installation of temporary culverts, and laying of geo-textile fabric.

Comment: A commenter advised maintaining Forest Roads 2205.1 and 2005.2 for possible future access to treatment areas, as well as for non-motorized public use.

Response: Road 2205.1 is actually a private road that continues on to national forest land, where it is designated as 2205.2. While we have no authority over roads on private land, we are anticipating we may need Road 2205.1 for future access to national forest lands. The Proposed Action for the Mill Brook Project would include designation of both of these roads at Maintenance Level 1. The rationale for the designation for 2205.1 is possible future access to Forest Service lands, and the rationale for 2205.2 is to allow access to stands for long-term vegetative management.

Comment: "Exactly what does it mean to decommission a road?"

Response: Road decommissioning is defined as activities that result in the stabilization and restoration of unneeded roads to a more natural state (USDA Forest Service, 2005b p. D-15). Basic road decommissioning techniques include blocking access to motorized use, removing culverts, restoring cross-drainages and wetlands, scarifying roadbeds, seeding, mulching, and restoring slopes. These and other techniques are described in detail in the FEIS on page D-16. Each road condition is different and will have a customized set of techniques applied. In some cases, because of the rapid growth of vegetation in the White Mountain National Forest, decommissioning may mean simply leaving the road to return to its natural state.

Proposed decommissioning in the Mill Brook project accomplishes two objectives: the first is to update the database to remove old skid trails that were identified as roads, and secondly to decommission segments of existing roads and update the database.

A mix of techniques would be used to decommission the roads on the ground and restore them to a natural condition.

Comment: "What is an unauthorized road?"

Response: From the Mill Brook Scoping Report, page 8: Unauthorized Roads are those that exist on the ground but are not currently in our database as designated "Forest Roads." A focus of our Roads Analysis is to assess all roads, including unauthorized roads, to determine if they are needed for long-term management activities: if so, we will designate them as Forest Roads and maintain them; if not, they will be decommissioned.

Comment: "I am concerned about the decommissioning of the "Old Road" between the village of Stark and Millbrook Road. This has been used as a trail by residents in this area for many years and it appears that the middle section of it will be impassable once the river stabilization measures have been completed."

Response: Motorized use of the Old Road is prohibited and so any unauthorized motorized use that may be occurring will be precluded as a result of the watershed restoration project. Foot travel would still be possible although the former roadbed would be roughened with woody debris and re-vegetated in order to restore the floodplain.

Comment: "…where I seem to be missing something has to do with the Road Proposed for Forest Road in area 2-30. I can't see in the table of roads (table 3) where this is mentioned."

Response: The southern portion of the Old Road is the road in question near stand 2-30. We are proposing to designate .4 miles of the Old Road as Maintenance Level 1 in order to provide access to stands on the west side of the Mill Brook Road.

Comment: "we do not need any more roads in this area, in fact some of the roads should be decommissioned."

Response: The proposal calls for decommissioning approximately 2.4 miles of roads in the Mill Brook area. No road construction is proposed.

Comment: "Regarding your restoration of roads in the area I would hope that they are not improved to interstate status…I would hate to see it improved much more than it is today."

Response: Road restoration entails some combination of the following as necessary: installation of temporary culverts, brushing, and shaping and repairing the road surface. One temporary bridge on FR 200 is proposed. When the project activities are complete, the roads would be waterbarred and closed, with the exception of FR 11E which would remain open to camp lessees along that road. As a Maintenance Level 2 road, improvements to FR 11E would allow for use by high clearance vehicles only.

Comment: "Please describe the traffic pattern changes and concerns that might result as a function of increased logging truck traffic in the area. Are there intersections or stretches of roads that might expect increased safety concerns due to the actions connected with the proposed activities?"

Response: Traffic pattern changes for NH Route 110 are expected to be minimal during the period of harvest. Recent harvesting on an inholding in the Mill Brook area used the same route to nearby markets as expected for the Mill Brook project. Safety concerns at the Mill Brook Road approach to NH Route 110 are minimal due to speed limits and visibility in each direction. Please see the Heritage section and the Socio-economic sections in Chapter 3 for more discussion on NH Route 110 traffic.

Comment: "Was the forest service responsible for constructing this Old Road which has caused flooding and watershed problems?"

Response: The Old Road was constructed by previous landowners.

Comment: A commenter requested the history of the existing road system, including why some are not currently system roads, and what funding codes were used to build them. The commenter also would like to know why the unauthorized roads were built and specific information regarding access to camps. In addition, the commenter asks for mileage of unauthorized roads in the project area and on the Forest, as well as road closure techniques and costs.

Response: Forest ownership in the area dates back as early as 1916 when the Forest Service purchased a 36,000-acre tract in the towns of Berlin, Randolph, Milan, Stark, and Kilkenny in Coos County. Other smaller tracts have been purchased periodically up until the late 1980s to create the present land base that composes the Mill Brook project area. Many of the roads constructed by former owners were used to access timber, and reflect the different methods of harvesting used over the past century. Bulldozer roads constructed perpendicular to the slope at regular intervals in the area east of the Mill Brook road provide the best example of past management activities and will be used as skid trails for portions of the proposed project. On-the-ground evidence still exists of these and other roads in the project area, some of which are documented on early (1929) maps of the Kilkenny area.

Although the Mill Brook Road (FR 11) has roughly paralleled Mill Brook for several decades in some form, its present location and condition was last determined in the early 1980s when it was improved/extended approximately one mile. Other major

road construction/reconstruction projects undertaken under Forest Service ownership include FR 199 (Hickory Brook) and FR 200 (Hickey Brook), occurring in the 1980s, and U-0014 which was constructed during the 1970s. Original construction of all other roads in the project area occurred under prior ownership.

See Section 2.2 for information about road closure techniques.

Information regarding funding codes, reasons for existing classifications, miles of roads Forest-wide, maintenance levels, road closure costs, Forest-wide roads analysis effects, funding for road "improvements, " who does the work, future road maintenance costs, and other questions regarding the road system are not site-specific related to this project, so are not answered here.

An analysis of the existing road system in the Mill Brook project area was conducted to determine the need for retaining or decommissioning roads or road segments. Roads needed to meet long-term management objectives will be retained and included as "Forest Roads" in our Forest database, while unneeded roads will be decommissioned and removed from the Forest Roads database. Our analysis considered 13.2 miles of road in the project area. We presented classification and decommissioning proposals to the public that indicated a need to retain most roads for long-term management, and to decommission about 2.4 miles of existing road. Part of this effort will be to adjust the Forest Roads database to reflect what's existing on the ground as well as any changes in road classifications.

Comment: "Please decommission as few and a little of the existing roads as is possible. Re-commissioning them will prove hugely expensive and improbable; let's maintain as much as we possibly can."

Response: Our roads proposals are intended to shift our current road system to one that meets our needs for access and resource protection into the future. Any roads decommissioned would have been deemed unnecessary for long-term management so would not be re-commissioned in the future.

Comment: "I cannot support the decommissioning of FR 199 as it offers access to a section in 2005 IRA that is not accessible from elsewhere. Let's allow that road to cause the removal of an area from the 2005 IRA so as to facilitate future treatment and use if and when it becomes necessary and available."

Comment: "If FR 200 is decommissioned then what will be the access to the landing at its active end? It appears on the map that FR 200 will serve Stands 2-10 and 2-12and the road should not be decommissioned yet. The same is true of 2203; from the proposed landing east, it serves the area of stand 2-45 and its use will minimize erosion and other negative impacts of treatement on the stand area."

Response: The proposal is to decommission only portions of these roads that were formerly used as main skid trails. Our goal is to maintain a road system that is safe, affordable, and responsive to public needs, meets vegetation, wildlife, and other management goals, and has minimal adverse ecological effects. The last segments of these roads are not needed for present or long-term management of resources.

Comment: "There does not appear to be an easy way to manage harvest activities in 2-10 and 2-12 without crossing streams; is this where you propose a new bridge? and if so, why not make the bridge permanent as this is only a small area that could easily be re-visited in the next decade."

Response: A temporary logging truck bridge is proposed for the Mill Brook crossing at FR 200 to access stands 2-10 and 2-12. A portable steel bridge supplied by the Forest or logging contractor is planned for use in combination with existing concrete abutments, making a permanent structure unnecessary. A temporary skidder bridge will be used to cross the smaller stream to the south of these two stands if they are harvested in the fall.

Comment: A commenter requests that a project-level roads analysis be conducted, that decisions made for more closure and decommissioning, and that and a copy of the Roads Analysis be provided to the commenter.

Response: A Roads Analysis was conducted and the proposals and rationales for reclassifications were presented in the scoping report (February 2007). The proposals are based on field examination and an assessment of the need for long-term access provided by each road in the project area, with a resulting 2.4 miles proposed for decommissioning.

Comment: "Can the Forest Service take advantage of the private roads and landings that have recently been installed so as to minimize further road development? Similar to FR 2205.1? where cooperative use is indicated on the map?"

Response: Road 2205.1 and an existing landing just to the west of the boundary line in the area (on Forest Service lands) were constructed by previous landowners. Although their location is well-suited to access timber in Stands 2-16, 2-19, 3-31, and 3-36, the Forest Service currently does not have a right-of-way to use Road 2205.1. Temporary rights-of-way can be purchased for the life of the proposed harvest, but are not lucrative agreements for those owners. No assurances are given that the ability to reuse the transportation system exists at the next harvest and beyond, especially if a private ownership should change hands in the future. The Forest Service does not seek permanent rights-of-way across private ownership. An existing landing at the end of FR 200 will provide access to those stands mentioned above without further road development aside from normal road restoration maintenance.

Comment: "I've read the Mill Brook Vegetation Management – Scoping Report. I was puzzled by one item in Table 1. Namely, road restoration was proposed for FR 200 although FR 200 didn't lead to an area where any logging was proposed."

Response: Stands 2-10, 2-12, 2-16, 2-19, 3-31 and 3-36 would be accessed by FR 200.

Comment: "The Forest Service proposes to change the legal status of a number of unauthorized roads to legal Forest Roads. Please explain the legal or regulatory authority for making this change…"

Response: Road management direction is outlined in the Transportation Rule and Policy published in the Federal Register (36 CFR 212). Section 212.5b1 outlines the process for: identifying "the minimum road system needed for safe and efficient travel and for administration, utilization, and protection of National Forest lands…The minimum system is the road system determined to be needed to meet resource and other management objectives adopted in the relevant land and resource management plan (36 CFR 219), to meet applicable statutory and regulatory requirements, to reflect long-term funding expectations, to ensure that the identified road system minimizes adverse environmental impacts associated with road construction, reconstruction, decommissioning, and maintenance."

Comment: Describe the effects of increases in visitor access that improved roads would provide, and the techniques and effectiveness of closing temporary roads.

Response: The following segments with proposed increases in Maintenance Levels (ML) are merely database changes to reflect the existing conditions and uses of the road, and are not considered "improvements."

FR 11E	0.5 miles from ML 1 to ML 2	Database adjustment
FR 199	1.0 mile from ML 1 to ML 2	Database adjustment
2203	0.1 miles from unauthorized to ML 1	Database adjustment
2205.2	0.6 miles from unauthorized to ML 1	Database adjustment
2400	0.6 miles from unauthorized to ML 1	Database adjustment
U-0014	0.2 miles from unauthorized to ML 1	Database adjustment
U-1003	0.2 miles from unauthorized to ML 2	Database adjustment
Old Road	0.5 miles from unauthorized to ML 1	Database adjustment

ML 1 roads are intermittent service roads, maintained to protect resources when not in use, and restored when needed for periods of management activities. They are closed to vehicular traffic unless needed for management purposes, and so would have no effect on visitor access. ML 2 roads are maintained for high clearance vehicles. FR 11E and FR 11A are already maintained to this standard and no increase in visitor traffic is expected because of these database adjustments.

Comment: "…there is the discussion regarding roads. With the budget constraints/ road maintenance backlog that the Forest Service is under why are you proposing to add more roads, especially those that are "unauthorized roads" to the Forest Roads database?"

Response: The Roads Analysis compared the database and the roads as they exist on the ground and made recommendations for designation as Forest Roads or decommissioning based on long-term resource needs. As a result, there would be a net loss of national forest mileage of Forest Roads.

Comment: "…shows a couple roads proposed for Forest Road on land that is marked as "Private Ownership" …How is it possible for the Forest Service to place roads that are on Private land into the Forest Roads database."

Response: There are numerous examples of Forest Roads in the database that exist on private ownership - in fact, several private landowners are crossed by FR 11. The proposal to place 2205.1 and 2204 in the database simplifies the classification process: If the Forest Service were ever to pursue a permit to use these roads or negotiate a purchase of the private inholding in question (both a distinct possibility), the roads would not have to go through the lengthy process of be added to the database as new roads.

Comment: What effect would there be on the camps if unauthorized roads were closed instead of made into Forest Roads?

Response: Road U-1003 provides access to three permitted camps on national forest land and we are proposing to designate it as a Forest Road.

Comment: "… requests that the Forest Service develop an alternative that would close and decommission any roads that encroach into the Kilkenny IRA within the

project area. We also request that the Forest Service close and decommission the unidentified road that provides access to Stands 3-13a, 3-16a, 4-15, and 4-34, starting at a point just beyond the private land boundary…Roads that encroach the IRA include the end of that specific road, unauthorized roads 2205.2 and 2205.1, FR 200, and FR199."

Response: The Forest Service considered the request to develop an alternative that would close and decommission all roads within the Kilkenny IRA within the vicinity of the Mill Brook area, but this alternative was not analyzed. The Kilkenny IRA was identified as meeting inventoried roadless criteria, making it 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 (MAs). Roads listed by the commenter all fall within MA 2.1, which recognizes that some roads and trails will receive limited use, while others will be used heavily at times (USDA-FS, 2005a, p.3-3). See also effects analysis of the Kilkenny IRA in Chapter 3.

Comment: "The landing for 2-24 is right on Mill Brook Road; a buffer zone is recommended."

Response: Standard erosion control measures (ditching, silt fence, culvert installation) are used as needed at the time of landing construction, use, and time of closure.

Comment: "If FR 2204 has become a stream channel then decommissioning is appropriate; but it appears to serve as an access point for Stand 2-19."

Response: Terrain in the area does not permit Road 2204 to serve as a viable access point for stand 2-19. See the picture of the restoration project/Road #2204 in Section 1.1.

12. Vegetation

Comment: "The forest service has failed to analyze the condition of the private lands that are contained in the Mill Brook HMU when looking at the overall condition of the affected area."

Response: Please see Section 3.1 and the cumulative effects analysis for each resource for analysis regarding private land within and adjacent to the Mill Brook HMU or appropriate watersheds. Also refer to the analysis area maps in Appendix A.

Comment: "Regarding the Roadless Inventory Area: let's get the proposed harvest areas of 3-13a, 3-16a, 4-14 and 4-34 underway as soon as possible…lets get these small areas harvested and into a form of management appropriate to permanent wildlife openings and diverse regeneration."

Response: The stands mentioned above are part of the project proposal and cannot be harvested without the appropriate analysis within this document. An alternative will be selected at the district level that ultimately determines which stands will be harvested after carefully weighing analysis by the affected resource specialists and receiving input from the public.

Comment: "Perhaps greater regeneration to northern hardwoods could be accomplished by spreading out the clear cuts proposed for 2-34b into smaller units within 2-34d, 2-34e and 2-35b. From the map; one large clear cut will probable be used as a landing with resultant high soil compression. This area is far enough from FR 11 to serve as wildlife habitat without human interference; let's make every effort to keep it free of invasives…"

Response: The clearcut treatment recommended for stand 2-34b is the result of several stand reconnaissance efforts in the area by resource specialists. A majority of timber in this stand is of low quality and at higher elevations suffers from moderate to heavy amounts of ice damage. This stand offers one of the best opportunities to regenerate northern hardwoods in the area. Stand 2-34d is a northern hardwood stand of higher quality with the potential for vigorous growth following the proposed thinning. Stands 2-34e and 2-35b both contain an element of softwood. Proposed groups ranging in size from 0.1-2 acres in size are expected to maintain the mixedwood character and most likely will generate some hardwood regeneration. (Project file)

Forest Plan goals and objectives will be observed with regards to invasives. (USDA-Forest Plan, 2005a. p 1-7)

Comment: "Will the areas immediate south of 3-31 and 3-36 be considered for treatment in the near future? Continued activities there will support the upgrade of 2205.1 to a forest road; if not, I'm not sure the treatment activities will be worth the effort."

Response: Stands to the south of 2205.2 were harvested prior to Forest Service acquisition of this area in 1988 and were determined to not need treatment in the near future. The proposed project calls for stands 3-31 and 3-36 to be accessed from the landing at the end of FR 200.

Comment: "Stand Regeneration: the scoping letter mentions the use of prescribed burning. Would other types of regeneration be used besides prescribed burning?

Response: The original Mill Brook project proposal included some prescribed fire or mechanical treatments to perpetuate paper birch. Those sites have been dropped from the current proposal and so prescribed burning is now limited to permanent wildlife opening maintenance.

Comment: Improvement Cut: Please explain what is meant by the term "improvement cut". Is it considered even or uneven-aged management? What basal area would remain after harvest? What kinds of "improvements" to habitat or vegetative quality are sought?

Response: An improvement cutting is the removal of less desirable trees of any species in a stand of poles or larger trees, primarily to improve composition and quality (Helms, J.A. pp 93-94). The treatment is considered uneven-aged management, with an expected residual basal area of 70-80 sq. ft/acre. Improvements are generally vegetative such that stems of lower quality or less desirable species will be removed in favor of potential crop trees. Wildlife standards and guidelines (USDA-Forest Plan, 2005a. pp 2-33 to 2-36) are applied to improvement cuttings similar to other individual tree selection harvest systems.

Comment: "Use of Even-Aged Management: The Forest Service needs to fully develop and consider uneven-aged management alternatives…The National Forest Management Act mandates that the Service ensure that even-aged management practices be used in the national forests only when "consistent with the protection of soil, watershed, fish, wildlife, recreation, and aesthetic resources, and the regeneration of timber resource"…The Forest must explain why even-aged management is necessary in this case."

Response: In addition to the consistency findings pertaining to the White Mountain National Forest Land and Resource Management Plan, the National Forest Management

Act establishes specific guidelines for prescriptions involving vegetative manipulation for the National Forests. The even-aged management prescriptions for the Mill Brook project are consistent with these guidelines and are based on the best available science as shown below:

1. The prescription is best suited to the multiple-use goals established in the Forest Plan for this area and considers the potential environmental, biological, cultural, scenic, engineering, and economic impacts as stated in the White Mountain National Forest Plan. Even-aged management prescriptions are optimal where applied because they regenerate stands that are mature (USDA Forest Service 2005b, Appendix B); and they protect other resource values, mitigate effects, provide wood products to the regional economy, and help achieve Forest Plan objectives (see EA Chapter 1 and the Wildlife analysis (Section 3.15).

2. The prescription assures that lands can be adequately restocked except where permanent openings are created for wildlife habitat improvement, vistas, recreation uses and similar practices. The practices prescribed for the Mill Brook Project are the same as those that have been successful in restocking WMNF MA 2.1 lands during past management entries (USDA Forest Service 1993-1996, 1998-2000, 2006e).

3. An alternative is not chosen because it would give the greatest dollar return or the greatest output of timber. The rationale for selecting an alternative will be given in the Decision Notice; it will be based on all information available to the responsible official, not just projected revenues or timber output.

4. The prescription should be chosen after considering potential effects on residual trees and adjacent stands. Adverse effects to residual trees or adjacent stands are not anticipated because the prescriptions are developed with these factors in mind, and with close communication with the sale administrator, and instructions for marking to implement a harvest and removal process that has proven to protect residual trees and adjacent stands from undue damage (USDA Forest Service 1993-1996, 1998-2000, 2006e).

5. The prescription maintains site productivity and ensures conservation of soil and water resources. The prescriptions implement Forest Plan standards and guidelines and are designed to prevent the permanent impairment of site productivity and to conserve water resources (EA Sections 2.5, 3.3, 3.10, and 3.12). Forest site productivity will remain constant and adequate re-stocking of clearcut and shelterwood stands is anticipated based on the history of regeneration on similar soils nearby and elsewhere on the District and Forest. No change in soil productivity is expected (see EA Section 3.10)

6. The prescription provides the desired effects on water quantity and quality, wildlife and fish habitat, regeneration of desired tree species, forage production, recreation uses, scenery, and other resources. The prescriptions meet Forest Plan standards and guidelines as described for MA 2.1 (USDA Forest Service 2005a p. 3-3), move the project area toward the desired conditions described in EA Section 1.1 and protect resources as described in Section 2.5, Design Features.

7. The prescription is practical in terms of transportation and harvesting requirements and total costs of preparation, logging, and administration. Both action alternatives use existing roads so no new road construction is proposed. Harvest design and mitigations to protect resources are practical and are designed to best meet resource management and protection objectives and human needs. Costs of project planning,

preparation, and sale administration are in line with typical WMNF timber sales (see Section 3.9, Socio-economics).

Comment: "The report mentions that 313 acres within the 2005 Kilkenny Inventoried Roadless Area are included for harvest, and I think from the map that these are 2-10, 2-12, 2-16, 2-19, 3-31 and 3-36. In the table of proposed stands and their harvest treatment I don't find any information as to how the Inventoried Roadless designation affects these --- or does it?"

Response: Stands 2-10, 2-12, 2-16, 2-19, 3-13a, 3-16a, 3-31, 3-36, 4-34, and a portion of 4-15 total the 313 acres proposed for harvest that fall within the boundary of the Kilkenny IRA. This boundary was included on the project proposal map in response to public concern with timber harvesting in the IRA. All stands included in the project, regardless of inclusion in an IRA, are in Management Area 2.1, which allows timber harvesting. Section 3.5, Inventoried Roadless Areas, provides some background information on IRA designation and also addresses the effects of harvesting in the IRA.

Comment: "coming in and recutting after 15 years is hardly proper time for a species to grow or to disburse seeds so others grow."

Response: Uneven-aged management techniques, such as individual tree selection, improvement cuts and commercial thinning promote a forest of varying age classes and species mix. With this system, a portion of each age and size class is harvested on a regular cutting cycle of 15 to 20 years to provide growing space for new trees and maintain a continuous high forest canopy. This cutting cycle is also based on stand density (basal area), area to be harvested and growth rates for northern hardwoods. Within 15 years of harvest, a stand will go from a residual basal area of 70 sq.ft to 100 sq.ft. (Leak et al, 1987). This is an opportune time to harvest stands and obtain forest products as well as maintain good growth rates on residual trees. If stands become too crowded, tree growth slows and regeneration of intermediate shade tolerant species such as sugar maple and yellow birch are out-competed by shade tolerant species. There is also a guideline in the Forest Plan that states selection cuts should be made on a 15 to 20 year entry interval. (USDA-Forest Plan, 2005a. p 3-6)

Prior to proposing stands for silvicultural treatments, stands are evaluated on growth and mortality rates along with other factors. There is no evidence of continual stress on the vegetation within stands from past harvest activity. In fact northern hardwoods, especially sugar and red maple, and yellow birch exhibited good growth rates after past harvest activities. Also, the regeneration opportunities for sugar maple and yellow birch are increased due to the addition of sunlight reaching the forest floor.

Comment: "I find that individual tree harvesting has to be very carefully done or there is more damage done than is gained. Especially with modern equipment, a high level of supervision is required. Is this done?"

Response: All timber harvest, including individual tree and group harvests are carefully planned to minimize damage to the residual stand of timber and associated resources. Operating seasons are assigned to protect resources, including water, soils, vegetation, and wildlife. For example, because bark is more susceptible in the summer when sap is running, areas of individual tree selection and thinnings are primarily scheduled for fall and winter harvest to reduce the likelihood of damage by equipment moving through the stand. Winter harvest is also required in wetter areas so that soils are frozen when equipment is in the area. The Forest Service Timber Sale Administrator must approve all skid trail locations so that the least amount of ground

and residual stand is affected, and is responsible for supervision of harvesting activity and enforcement of various contractual provisions that provide protection for the resources.

Comment: "we do not want a "mix" of habitats for wildlife species, which is simply encouraging edge wildlife over interior forest wildlife."

Response: We made a commitment in the Forest Plan to provide a diversity of habitats for reasons detailed in the FEIS. The proposed project will create edge habitat and will move the habitat conditions closer to the habitat goals for the HMU. Table 15 displays the current habitat conditions in the HMU and displays the many acres outside of MA 2.1 and those unsuitable for timber harvest, which will not have edge habitat created. Suitable habitat for forest interior wildlife species would be maintained under both Action Alternatives. Approximately 80% of the lands in this HMU will be in mature age class after implementation of either Action Alternative.

Created and existing habitats will be used by a variety of wildlife species, as discussed in the wildlife effects analysis in Chapter 3, section 3.15, as well as the Wildlife Report in the project file.

Comment: "Harvesting activities in 2-30 and 2-34d will directly impact the brook if some form of restriction is not applied. The proposed road runs immediately along the brook."

Response: Forest Plan standards and guidelines for Riparian and Aquatic Habitats address vegetation management and road restoration along perennial streams (USDA-Forest Plan, 2005a. p 2-24 to2-26). Also see effect analysis for Vegetation and Water Resources, Chapter 3.

Comment: "Stand 2-12 appears to enter two stream protective boundaries as described on the map. Please check the stand dimensions."

Response: The boundary of the treated portion of stand 2-12 was adjusted to account for riparian buffers along streams to the east and south.

Comment: "A buffer is…recommended for the west side of the north-south axis of stand 2-24 to minimize direct water and soil deposition on the (Mill Brook) road itself.

Comment: "Stand 2-45 also approaches FR 11 too closely. A buffer zone will also be necessary here and at the junctions of 2-59 and FR 11E. Some form of erosion protection will be necessary."

Response: FR 11 is a Maintenance Level (ML) 3 road which is kept open (primarily for summer use) and maintained for travel in a standard passenger car. This road is ditched and contains numerous culverts to collect runoff from stands adjacent to the road. For those portions of stands 2-24, 2-45 and 2-30 that are higher in elevation than the road, these ditches, existing regeneration and residual roadside trees will serve as a buffer to surface water and soil movement. Group harvests within these stands will be placed at locations to avoid the threat of soil or water erosion. Individual trees may be harvested along the road as part of carrying out the silvicultural prescription or in an effort to remove potential road hazards. Any roadside trees harvested in these stands and in 2-59 as part of individual tree selection will not be felled into roadways where dragging tops back into the woods may disturb the topsoil and lead to some form of erosion. FR 11E is currently a ML 1 road proposed for ML 2 designation as well as road restoration efforts to correct existing or potential erosion specific to that road.

The season of operation for stand 2-24 is winter, minimizing any soil disturbance from harvesting activities. Stands 2-45, 2-59 and 2-30 also may be harvested in the winter season.

Comment: "What the forest needs is more TSI and less commercial harvest."

Response: TSI and commercial harvests in a sense go hand-in-hand such that one of the long term objectives for any TSI treatment is to enhance stand development for future harvesting. Benefits of timber harvest can be seen in the effects analysis for each resource in chapter 3. Long term studies conducted on the Bartlett Experimental Forest in New Hampshire have shown positive effects of TSI although heavy considerations should be give to treatment costs (Leak and Solomon, 1997). TSI efforts on the Forest are generally species-focused and occur on sites where the response is more desirable.

13. Water Resources

Comment: A commenter was concerned with "increased water flow rates as a result of timber harvest, especially from clearcut sections…new channelization in the upper Mill Brook region could be a problem."

Comment: "…The proposed watershed restoration activities would likely decrease the risk of flooding and sediment loading from the affected road beds. However, the risks of increased flooding due to timber harvest must also be considered. Given the presence of numerous streams in and downslope of the project area, what mitigation measures are proposed to control the addition of sediments to said streams?..."

Response: Increased water quantity, including effects to peak flows, was considered through analysis in the Water Resources section 3.X under the topic of 'water quantity.' As discussed in this section, changes to water quantity, including peak flows, are related to the amount of basal area removed in a watershed as shown by research at Hubbard Brook, a research watershed located on the WMNF (Hornbeck et al, 1993 and 1997). There is no risk of increasing peak flows beyond natural levels when timber harvest removes 25% or less of a watershed's basal area. Analysis with GIS and calculations show that timber harvest proposes to remove no more than 15% in smaller delineated watersheds and less than 5% in the entire Mill Brook watershed, even when combined with activities on private lands. Because timber harvest is not expect to increase peak or base flows, new channelization related to the proposed timber harvest activities would not occur. The proposed watershed project in upper Mill Brook would prevent water from running down old roadbeds, thereby decreasing the potential for channelization in this area. Channelization in lower Mill Brook would also be prevented by another watershed project which would prevent high flows from running down an old road and reestablishing natural overflow channels.

Comment: "I wonder if the brook could (be) directed to partially run into wetlands during high water times?"

Response: No projects of this type were identified during the project assessment phase since wetlands related to the streams in the project area are mostly located in and adjacent to floodplains where high flows already naturally flow into these features. These features are located in low gradient areas of Mill Brook and its tributaries and help to reduce the magnitude of flood in the watersheds. There are large wetland areas in the Mill Brook watershed which are properly functioning and work in this way.

Comment: One commenter was concerned that the analysis must address the effects of activities on private land in the project area, in particular the potential for flooding.

Response: A cumulative effects analysis was done by the forest hydrologist to assess the potential for the proposed timber harvest activities to increase water quantity, including peak flows. Increased water quantity, including effects to peak flows, was considered through analysis in the Water Resources section (3.X) under the topic of 'water quantity'. As discussed in this section, changes to water quantity, including peak flows, are related to the amount of basal area removed in a watershed as shown by research at Hubbard Brook, a research watershed located on the WMNF (Hornbeck et al, 1993 and 1997). This research shows that there is no risk of increasing peak flows beyond natural levels when timber harvest removes 25% or less of a watershed's basal area. Analysis with GIS and calculations show that timber harvest proposes to remove no more than 15% in smaller delineated watersheds and less than 5% in the entire Mill Brook watershed, even when combined with past, present, and reasonably foreseeable activities, including those on private lands.

Comment: "Please describe the likely affects to water quality as a result of the proposed actions…"

Response: The potential for the proposed activities to change water quality is discussed in the Water Resources analysis in the EA (Section 3.12) under the topic of 'water quality."

14. Eligible Wild and Scenic Rivers

Comment: A commenter queried what project design and implementation features are proposed to ensure that Mill Brook retains its eligibility for Wild and Scenic River Status, as well as when the WMNF intends to proceed with activities to move Mill Brook from "eligible" to "listed" status.

Response: The Eligible Wild and Scenic Rivers section of the EA (Section 3.13) details effects to the Mill Brook eligible river resulting from selection of any alternative. Eligibility would be maintained under all alternatives. Because Outstandingly Remarkable Values were not determined for any of the rivers in the 1991 study that were incorporated as eligible into the 2005 Forest Plan, we are protecting all potential ORVs in the Mill Brook corridor. Additional study will be required in the future before any recommendations can be made regarding designation. The process for recommending eligible rivers for Congressional designation is described in FSH 1909.12 Chapter 80.

15. Wildlife

White-Tailed Deer

Comment: A camp owner on Peps Place Road (FR 2400) said he would like to see softwoods regenerated. He said the Hickey Brook area (Stands 2-10 and 2-12) used to be one of the best deeryards in the area and hopes it will be again.

Comment: "The New Hampshire Fish and Game Department has assigned this area C-1 and as you may be aware this area has the lowest deer density of deer per square mile than anywhere else in the State. Years back quite a few hunters visited the area and contributed to the local economy, however due to poor deer population in

the area hardly anyone hunts the area today. Thinning and opening up the Forest should encourage browse to benefit the deer herd."

Response: Stands 2-10 and 2-12 are northern hardwood stands and are not currently considered winter habitat for deer. However, there is a historical deeryard in the Mill Brook/Hickey Brook drainage (see Deer Wintering Habitat in Section 3.15 of the EA). More recent field surveys and track counts have recorded some deer use in the Mill Brook and Hickey Brook drainages but much less than observed in the 1970s.

We agree that it is important to regenerate and maintain softwood habitat to provide cover and food for a variety of wildlife species. We also strive to maintain core winter cover and provide browse in all known deer wintering areas. Both Alternatives propose some management in softwood habitat on lands that have an ecological capability to grow softwoods. See "White Mountain National Forest Ecological Approach" that describes the rationale for wildlife habitat management on the WMNF (USDA Forest Service 2002b). Within the historic Mill Brook deeryard, the proposed harvest in Stand 2-19 would stimulate softwood regeneration. Other harvest prescriptions that would increase or perpetuate softwood regeneration in the project area include Stands 2-24, 2-30, 2-35b, and Stand 3-16a.

We also recognize that one of the beneficial effects of the proposed timber harvest is to increase herbaceous and sapling growth as more light reaches the ground, providing an increased source of browse for a variety of wildlife species including white-tailed deer. The effects of the Alternatives on wildlife habitat are described in more detail in the Section 3.15 of the EA.

Permanent Wildlife Openings

Comment: A camp owner on Peps Place Road (FR 2400) said he is very supportive of wildlife opening expansion and would like to see the permanent wildlife opening on Forest Road 11 south of Forest Road 2400 reopened.

Comment: A commenter was in favor of greater acreage of permanent wildlife openings. She also stated that landings should serve as semi-permanent wildlife openings. Specifically, she wanted wildlife openings to be located in Stands 4-15 and 4-34. She said these stands were "4 or more miles from NH Rte 110 and yet close enough to 3-13 and 3-16 to facilitate movement and wildlife breeding/nesting activities"

Comment: A commenter was in favor of more wildlife openings than proposed and hope that we would do a better job of maintaining them than we have in the past.

Response: From the Forest Plan, one of the goals for wildlife habitat on the White Mountain National Forest is to maintain permanent wildlife openings at existing levels (USDA Forest Service, 2005a p. 1-21). Recent research indicates larger openings are more favorable to some of the bird species that breed in openings (SVE panel discussions, 2005, project file). For this reason existing wildlife openings will be expanded where possible, and in some cases new ones may be added as older existing ones are no longer maintained. Any opportunity to expand existing permanent wildlife openings or add new ones in the Mill Brook HMU is dependent on site-specific factors such as soils, diversity of herbaceous shrub cover, amount of woody saplings, soft mast, proximity to roads (for maintenance), potential productivity, topography, and proximity to softwood cover.

There are two existing permanent wildlife opening in the project area (Stands 2-48 and 2-49). After field reviews, it was decided to expand one of these openings (Stand 2-48). The expansion area for this wildlife opening is listed as Stand 2-29a for both Action Alternatives. The other existing permanent wildlife opening (Stand 2-49) is difficult to access and will no longer be maintained. Alternative 2 proposes a new permanent wildlife opening with easy access at the end of FR 11.

All of our designated permanent wildlife openings are scheduled for maintenance every three to five years. The Forest Service works aggressively to conduct this level of maintenance and has pursued various sources of funding to accomplish this work.

Any landings that are used in the timber sale will likely provide habitat for species associated with early successional habitat once they start to revegetate. While these areas will not be actively managed as permanent wildlife openings, they often provide this type of habitat for a number of years following completion of harvest activities.

We decided against putting permanent wildlife openings in Stands 4-15 and 4-34 because of difficult access. The decision to expand the landing in 3-13a was made due to the easier access for future maintenance.

Comment: "PWO 2-29a will likely serve as an accessible hunting area and as a playground for snowmobiles if a buffer zone is not employed to hide it from direct road access."

Response: The White Mountain National Forest is open to hunting including in permanent wildlife openings. Anyone hunting on the Forest must comply with State hunting regulations.

We do have concerns about permanent wildlife openings being used for alternate activities which could reduce the habitat value. We discourage the alternate use of permanent wildlife openings for such uses as helipads, campsites, or for special events, especially if they alter the habitat value of an opening (USDA Forest Service 2005a, p. 2-35). A buffer zone of uncut trees will be left along FR 11 to screen the opening and discourage alternate uses. See Design Features, Section 2.5.

Fragmentation

Comment: "We are concerned that the proposal will cause fragmentation of an area that is recovering from past logging in the early 1990s. A review of satellite images of the Mill Brook area reveals a fairly pristine watershed that has not been logged in many decades."

Response: There is a history of past logging in the watershed. Historical reports from land valuation done at the time of Forest Service acquisition shows harvesting had occurred prior to acquisition. Typically, the Forest Service would acquire lands in the Mill Brook watershed following intensive harvest by private landowners. The District has records of timber sales dating from acquisition to the present decade. See 3.1 for recent harvests.

Vegetation type or age class conversion in a heavily forested landscape such as the White Mountain National Forest is generally not considered forest fragmentation. Forested habitat on the WMNF is mostly mature, with few inclusions of human development. Some of the proposed harvests would create openings in the forest. However, research has found no evidence of the 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). Suitable habitat for forest interior wildlife species would be maintained under both Action Alternatives. Approximately 80% of the lands in this HMU will be in mature age class after implementation of either Action Alternative.

Cumulative Effects/Harvesting On Private Lands

Comment: "Please describe the likelihood of open canopy early successional habitat creation on non-federal land in and around the project area in the reasonably foreseeable future (using a minimum 15-20 year time period as the proposed harvest could reasonably be expected to take 10 years to complete). Please describe the likelihood of mature and old growth habitat on non-federal land in and around the project area in the reasonably foreseeable future (using a minimum 15-20 year time period as the proposed harvest could reasonably be expected to take 10 years to complete). We are concerned that the analysis of cumulative effects will be limited to the HMU in which the project resides. Effects do not stop at the HMU boundary. Will the cumulative total of early successional habitat on non-federal lands negate the need for on-forest early successional habitat creation?"

Comment "…given that logging has been conducted on the adjacent property by IP, I believe that there is more than enough of early successional habitat and any clearcuts should be dropped from the project."

Comment: "We do not support the artificial creation of early successional habitat. Do not log mature stands on the WMNF as early successional habitat is abundant outside the Forest."

Comment: "I think some consideration should be given to the recently logged private land and how it might affect this project."

Comment: "I believe your agency is not taking into account the large-scale logging that is happening on the areas surrounding the Great North Woods Region of the White Mountain National Forest."

Comment: "The forest service has failed to analyze the condition of the private lands that are contained in the Mill Brook HMU when looking at overall condition of the affected area. The failure to consider privately owned land in the HMU could result in false conclusions for the need to create further regeneration of trees."

Response: We decided to use a 10-year time-period for our temporal scope when considering cumulative effects to wildlife habitat, because the beneficial effects of early successional forest to wildlife start to decline after ten years. Our standard timber sale contracts are three years, and it is unlikely that a timber harvest project would take 10 years once a contract has been awarded.

In evaluating the effects of a project on habitat composition and age class objectives, conditions in other HMUs or on adjacent private lands are considered if the analysis indicates that their inclusion is appropriate. Private lands are often included in the analysis, however it can be difficult to determine how far, and in which direction, effects may be noticeable. The rationale for the cumulative effects timeframe and analysis for wildlife habitat are described in the Section 3.15 and in the Wildlife Report in the project file.

When deciding on an appropriate and reasonable cumulative effects analysis area for vegetation and wildlife for the Mill Brook project, we considered past, present, and future logging in the Mill Brook HMU, the neighboring South Pond HMU and logging that has occurred on private lands within and surrounding the Mill Brook HMU in recent years

We had good information on past harvest history in the Mill Brook and South Pond HMUs (see description of past logging in the Mill Brook HMU and South Pond HMU in the cumulative effects under the Vegetation (Section 3.11) and Wildlife (Section 3.15) in the EA). However we had less detailed information on the amount of harvesting on surrounding private lands (Towns of Stark and Northumberland) adjacent to the project area. We sought information on recent harvesting on adjacent private lands by reviewing timber harvest records at the Stark Town Office, and by reviewing summaries of forest inventory information in Coos County from the most recent publication on Forest Statistics for New Hampshire (Frieswyk and Widmann 2000). After these reviews we still felt we did not have enough information on the recent harvest history in this area. We learned of a joint project between the Society for Protection of New Hampshire Forests and Dartmouth College to document the percent of heavily harvested areas by town over time using remote sensing (Sundquist pers. comm. 2007). A review of these preliminary data for Stark and Northumberland found increases in harvested land in these areas between 2002 and 2005 (Sundquist pers. comm. 2007). However the percentage of heavily harvested lands in each town is less than one percent, even with the increases in harvesting in recent years.

The goals set in the Forest Plan are to maintain approximately 3% of an HMU in regeneration forest habitat, which is equivalent to approximately 350 to 450 acres for the Mill Brook HMU. Currently there 96 acres of regeneration age class habitat in the Mill Brook HMU. Both Action Alternatives are proposing 47 acres of clearcuts, which is far less than the goals set for this HMU. No future harvests are planned in this HMU in the next ten years. In the South Pond HMU, there is a goal of 300 to 400 acres of regeneration habitat and there are 160 acres existing. The North Kilkenny Project would create 100 acres of regeneration habitat in the next several years, and there may be additional harvesting in this HMU in the next ten years.

In conclusion, we are striving for but still falling short of the regeneration forest habitat goals in the Mill Brook and South Pond HMUs, even with the recent and planned harvests. The amount of heavily harvested areas on private lands considered in the cumulative effects analysis area is less than 1%. We feel we have taken into account harvesting on private lands adjacent to the project area and there is still a need to increase the amount of regeneration habitat in the Mill Brook HMU.

The cumulative effects analysis for Wildlife, Vegetation-Timber Resources, Non-Native Invasive Species, and Threatened, Endangered, Proposed, and Regional Forester Sensitive Species included activities on private inholdings as well as private lands outside the national forest boundary in the Towns of Stark and Northumberland. Activities on private inholdings were included in the cumulative effects analysis for all other resources, with predicted effects disclosed in Chapter 3.

Habitat Management Unit

Comment: "We are concerned with the use of the Habitat Management Unit (HMU) model. Dividing the forest up into HMUs and trying to recreate the range

of environmental conditions is an incorrect way to manage the Forest. The project proposal should focus on conditions and habitat needs across the Forest within the context of habitat conditions across the Region."

Comment: "The Forest Plan did not address the HMU model."

Response: Every Forest has some mechanism or model for ensuring that landscape-level goals and objectives are met and that habitats are distributed across the Forest in a way that is ecologically appropriate. Some Forests accomplish this through extensive standards and guidelines; others divide the Forest into many small Management Areas with unique management goals and objectives; still other Forests leave it to resource specialists to determine the best approach during project development and then explain their rationale in each environmental analysis. The HMU framework is specific to the White Mountain National Forest. Input from internal and external forestry and wildlife experts (including the research community) supported the HMU approach as a reasonable way to help the Forest achieve our habitat objectives (USDA Forest Service 2002b, 2007).

The FEIS for the Forest Plan analyzed vegetation management for wildlife habitat (USDA Forest Service 2005b pp. 3-73 through 3-112). The role of the HMU model and how it fits into an ecological setting on a local and regional scale is described in the "WMNF Ecological Approach" (USDA Forest Service 2002b) which is a supporting document of the Forest Plan. The Forest Plan incorporates HMUs in Wildlife Habitat Management S-1 (USDA Forest Service 2005, p. 2-33). This Plan was not appealed during the administrative appeal period of 90 days after the Record of Decision was signed. Input from internal and external forestry and wildlife experts, including research, supported the HMU approach as a reasonable way to meet our habitat objectives (USDA Forest Service 2002b and 2007).

Comment: What are the current age class percentages on the Forest (not just in the Mill Brook HMU)? How do they compare to Forest Plan goals? How has age class % been assessed? How are natural disturbances accounted for?

Response: Age class percentages for the Forest were most recently calculated during Forest Plan revision and are listed in the FEIS (USDA Forest Service 2005b p. 3-85). They are as follows:

Hardwood	=	<1% regen; 18% young; 63% mature; 18% old.
Mixedwood	=	<1% regen; 7% young; 67% mature; 25% old.
Spruce-Fir	=	<1% regen; 2% young; 33% mature; 65% old.
Aspen-Birch	=	<1% regen; 7% young; 6% mature; 87% old.
Oak-Pine	=	<1% regen; 8% young; 39% mature; 53% old.
Hemlock	=	<1% regen; 4% young; 78% mature; 18% old.

Forest Plan age class percentage objectives for MA 2.1 (All other MAs are not managed so there are no age class objectives) are as follows:

Hardwood	=	3-4% regen; 15-20% young; 61-67% mature; 15% old.
Mixedwood	=	1% regen; 5% young; 73% mature; 21% old.
Spruce-Fir	=	1-2% regen; 3-6% young; 66-70% mature; 26% old.
Aspen-Birch	=	12-15% regen; 36-45% young; 8-30% mature; 22% old.

Oak-Pine (no age class goals for oak-pine).

Hemlock (managed using uneven-aged management so no age class goals).

How age class conditions change and how well the Forest is meeting Forest Plan habitat objectives is part of the Forest Plan monitoring program, to be evaluated every 5 years (Monitoring and Evaluation Guide).

Mill Brook HMU Age class percentages

Hardwood	=	1% regen; 15% young; 83% mature
Mixedwood	=	0% regen; 6% young; 94% mature.
Spruce-Fir	=	0% regen; 0% young; 100% mature.
Aspen-Birch	=	0 regen; 6% young; 94% mature.
Hemlock	=	0 regen; 0% young; 100% mature.

The existing age class and forest type information come from the best available information: corporate databases, GIS shapefiles, reviews of stand records, and field examinations. Therefore, the current condition information describes actual age and habitat conditions to the best of our knowledge. The age class objectives take into account habitat type and suitability of the land for timber harvest. Non-vegetated habitats, such as wetlands, lakes, ponds, and gravel pits, are not considered in the age class conditions or objectives.

Natural disturbances are acknowledged as the primary way that age classes would change in non-managed lands on the WMNF, and are acknowledged as additive to age class objectives created through vegetation management in MA 2.1 (USDA Forest Service 2005a, pp. 3-100 to 3-110). The Terrestrial Habitat Management Reference Document provides guidance in evaluating natural disturbance when developing age class objectives for an HMU (USDA Forest Service 2007). Specifically it states that "Any regenerating forest habitat that is created by a stand-replacing natural disturbance on MA 2.1 lands should be counted toward meeting the regeneration forest objective in the HMU and that the condition of private lands or other lands in the HMU should be considered when developing HMU objectives." Based on stand exams and field reviews (field notes in project file), there are no mid- to large-scale natural disturbances in the project area.

Comment: "Please indicate how the proposed action will work toward all age class objectives."

Response: The effects of the Action Alternatives on the age class objectives for the Mill Brook HMU are discussed in Section 3.15 of the EA. Additional detail and calculations are available in the Wildlife Report in the project file.

Wildlife Habitat

Comment: …one objective is to provide a balanced mix of habitats for wildlife species. How about identifying what species will benefit and what the negative impacts are on other species. In a regional context this project will reduce habitat for some species such as lynx, fisher, and others.

Response: The Forest uses Management Indicator Species to track the effects of timber harvest and wildlife habitat management on wildlife. Populations are tracked at a much broader area than the project level and encompass the effects of timber harvest

on the WMNF as well as activities on lands surrounding the Forest (USDA Forest Service 2005b, pp. 3-165 through 3-187 and pp. 3-196 through 3-201).

The effects of the Alternatives on wildlife habitat and MIS are described in more detail in the Wildlife Section of the EA (section 3.15). To get information on the full array of wildlife species that inhabit New England and their habitat preferences and range, refer to these publications: DeGraaf and Yamasaki 2001, DeGraaf et al. 2006.

Both Action Alternatives would likely benefit fisher by diversifying habitat and increasing the variety of prey available. Fisher require wetlands and forests in a variety of age classes to meet their need for adequate prey, which includes small mammals, snowshoe hare, birds, eggs, and carrion. They also feed on vegetation such as berries. Special habitat needs include large hollow trees for dens and dense regenerating softwoods (DeGraaf and Yamasaki 2001, DeGraaf et al. 2006).

The effects of this project on Canada lynx are described in the Biological Evaluation and summarized in Section 3.16 of the EA.

Comment: "Stand 2-38 is high enough in altitude to have a spruce-fir understory and there is plenty of paper birch in surrounding areas. But let's not act to remove large areas of paper birch without ensuring its proper regeneration. Following the ice storm it remains to be seen which species will proliferate in areas of damaged birch."

Response: Stand 2-38 has been dropped from this proposal as further field review found that this area was not suitable for logging due to steep and rocky terrain. Stand 2-38 is a paper birch stand that has thick spruce-fir in the understory.

Our approach regarding aspen-birch is to regenerate existing stands unless field reviews find that it has declined to the point where regeneration would not be successful. If aspen-birch regeneration is not feasible in an existing paper birch type, the soil type would be evaluated to determine if the site should be best managed as a softwood or northern hardwood site. To offset any loss of existing paper birch habitat, opportunities to manage for paper birch in northern hardwood or spruce-fir stands that have a strong paper birch component are considered.

The effect of the ice storm on tree species regeneration is related to how much light is reaching the forest floor. Where extensive ice damage opened up the canopy, aspen-birch would be favored because it regenerates well in full sunlight. Where less damage occurred and the canopy remained fairly closed, shade tolerant species such as beech would be favored. The ecological land type (ELTs) of an area also will determine which species will regenerate in a stand. Some ELTs are favored by softwood species while others are favored by hardwood species.

Comment: "The resident wildlife will move and it will be years after the project is over before they come back – unless another project drives them. We have watched this in other areas. You will move on in the F. S. and we will die but your name will be on the project."

Response: Some individuals will be temporarily displaced from harvest locations but will remain in the project area. The effects of the Alternatives on individuals, species, and wildlife habitat are described in detail in the Wildlife Section (3.15) of the EA. To get information on the full array of wildlife species that inhabit New England and their habitat preferences and range, including species that favor disturbance habitat

(including disturbance associated with timber harvest), refer to these publications: DeGraaf and Yamasaki 2001, DeGraaf et al. 2006, Thompson III. et al. 2001.

Comment: The proposed action provided little description of the vegetative conditions in the project area. The EA needs to provide further details as to vegetative conditions other than trees. What plants occupy the project area or will be affected by project activities? In addition, what wildlife (mammals, birds, amphibians, fish, aquatic species, insects, etc.) occupy the project area?

Response: The BE (summarized in section 3.16), Vegetation (3.11) and Wildlife (3.15) Sections of the EA describe the plants and wildlife habitat, and some species present or likely to occur in the project area. A more detailed reference list and any results of surveys and monitoring in the Project Area are described in the BE, Wildlife Report, and Botany Report in the project file.

Comment: What predators will take advantage of the increased access to the area that the creation of early successional habitat will provide? What species will be negatively affected by the increased access? What other open canopy early successional habitat exists in and around the project area that these species might occupy?

Response: Early successional habitat can provide a flush of new growth that support increased local use by species that may be prey such as snowshoe hare, mice, some songbirds (e.g. chestnut-sided warbler and mourning warbler) and many insects. "Predators" come in many shapes and sizes. For example, many bat species (including TEPS species) will forage for insects in openings; raptors will take advantage of openings to capture songbirds and mice; carnivores such as marten, coyote, bobcat, and lynx will hunt along openings for snowshoe hare and mice. All of these species are indigenous members of these communities. The Forest's Species Viability Evaluation identifies species that might be at risk for loss of viability on the WMNF (USDA Forest Service 2005b, Appendix F, USDA Forest Service 2005e). No early successional species made the list, therefore, predation is not expected to cause negative impacts to any species utilizing early successional habitats.

The affected environment for wildlife (Section 3.15) describes the amount of early successional habitat (regeneration age class) in the Mill Brook HMU. The description of the cumulative effects analyses in the Vegetation (3.11) and Wildlife Sections describe the amount of early successional habitat in the adjacent South Pond HMU and on surrounding private lands and the effects on wildlife from the proposed harvest.

Comment: Which species will benefit or be negatively harmed from the creation of increased age class and habitat diversity? "What species will be harmed from the loss of late successional habitat? If negative effects are anticipated, what mitigation measures are recommended?"

Response: The effects of gaining regeneration age class and losing mature age class are discussed in the Wildlife Section (3.15) of the EA. Neither Alternative 2 nor 3 would result in reaching our goals for regeneration age class, and mature age class would remain dominant in the HMU. No negative effects are anticipated.

Our wildlife habitat strategy was developed based on research indicating that diverse forest types and age classes provide habitat for the full array of wildlife species that inhabit the White Mountain National Forest (DeGraaf and Yamasaki 2001, DeGraaf et al. 2006).

Comment: The literature is clear about the need for early successional wildlife habitat. The Mill Brook project harvest proposals come close to meeting the Forest Plan target for this habitat. The combined amount of clearcuts, patch cuts, and overstory removals come close to forest plan target for early successional habitat. Group selection will also supply these needs to many wildlife species.

Response: Forest Plan goals for MA 2.1 are as follows:

Hardwood	=	3-4% regen; 15-20% young; 61-67% mature; 15% old.
Mixedwood	=	1% regen; % young; 73% mature; 21% old.
Spruce-Fir	=	1-2% regen; 3-6% young; 66-70% mature; 26% old.
Aspen-Birch	=	12-15% regen; 36-45% young; 8-30% mature; 22% old.

Oak-Pine (no age class goals for oak-pine).

Hemlock (managed using uneven-aged management so no age class goals).

The Forest Plan goal is to maintain approximately 3-4% of an HMU in northern hardwoods regeneration forest habitat (defined on page 23 of Forest Plan glossary, USDA Forest Service 2005a) which is equivalent to approximately 195 to 260 acres for the Mill Brook HMU. The Forest goal for aspen-birch habitat is 12-15% which is about 100-125 acres of the Mill Brook HMU. Currently there are 96 acres of northern hardwoods regeneration age and 3 acres of aspen-birch regeneration age habitat in the Mill Brook HMU. Both alternatives propose 47 acres of clearcuts in northern hardwoods and none in aspen-birch, resulting in conditions which are far less than the habitat goals set for this HMU.

Overstory removal (resulting in young age class) and group selection harvests do not contribute to the goal for regeneration forest habitat. The proposed overstory removal is in a spruce-fir stand (3-16a) and would release young spruce-fir in the understory. This treatment would benefit species associated with young age class such as snowshoe hare (see Cumulative Effects in the Wildlife Section in the EA). Some of the proposed group selection treatments in hardwood stands, where group size can be up to 2 acres, would likely provide habitat for some wildlife species associated with forest regeneration habitat. However, research has found that group selection does not provide similar type of benefits to wildlife as clearcutting (Costello et al. 2000). Group selection proposed in softwood stands in the project area would not likely provide any habitat benefit for species associated with forest regeneration habitat as the group size is too small.

Viability

Comment: Viability and MIS under 1982 Regulations – Even though the 2005 NFMA regulations relieve the agency of population inventory monitoring and allow the Forest Service to "comply with any obligations relating to management indicator species by considering data and analysis relating to habitat," this does not relieve the agency of other requirements in the 1982 NFMA Rule. The Forest Service must still meet their ultimate requirements 1) to maintain viable populations of existing native and desired nonnative species in the planning area and must 2) provide habitat to support, at least, a minimum number of reproductive individuals with 3) habitat that is well distributed so that those individuals can interact with others in the planning area.. 36 CFR § 219.19 (1982). The new rules also do not relieve the

agency of the requirement 4) to monitor population trends of the management indicator species and determine relationships to habitat changes. 36 CFR § 219.19 (a)(6) (1982). All of these requirements apply to the planning area, which includes both the area covered by the Forest Plan as well as the proposed project area. The project area must include determinations that the Forest Service will 1) maintain viability in the project area ("Maintain viability", 2) provide habitats to support, at least, a minimum number of individual reproductive individuals ('Minimum numbers"), 3) with habitat that is well distributed so that individuals can interact with others in the planning area ("well distributed"). There also must be reference to 4) monitoring of population trends (even if only by habitats) of indicator species to determine relationships to habitat changes ("trend monitoring"). A through discussion must be in order to pass muster.

Response: The regulations promulgated at 36 CFR 219.19 instructed the process for development or revision of Forest Plans under the 1982 planning regulations. The WMNF revised its Forest Plan under the transition provisions of the 2005 Rule, 36 C.F.R. § 219.14(2005), which allowed us to use the planning procedures of the 1982 regulations. Based on court rulings since 2005, the Forest Service now operates under the 2000 planning regulations and the 2004 Interpretative Rule. This Interpretative Rule explains that project-level decisions made after promulgation of the 2000 regulations are not subject to the 1982 regulations, but instead are subject to the requirement to apply "best available science" and must be consistent with the underlying Forest Plan (69 Fed. Reg. 58,057).

Analysis of wildlife habitat condition and its distribution across the landscape, management indicator species, and species viability were completed as part of the Forest Plan revision. In addition, the WMNF completed a comprehensive evaluation of monitoring data within the forest-wide planning area entitled, "Evaluation of Wildlife Monitoring and Population Viability" (USDA Forest Service 2001), which included some of the same MIS as in the revised Forest Plan. MIS may be affected by individual project actions or no actions, however, viable populations of MIS are to be maintained or monitored in the Forest-wide planning area. Our analysis at the project level references the forest-wide viability analysis and we also analyze effects to the existing habitat condition within the HMU and how that might effect MIS species that might occur in the project area (see Wildlife Section 3.16). Monitoring of habitat conditions and trends across the Forest is documented in the annual monitoring reports (USDA Forest Service 1993-1996, 1998-2000, 2006e).

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

Comment: "Please add vegetation management to enhance the survival of rare, threatened, endangered or ranger sensitive species (TES) and to prevent encroachment of invasive species" to what the Forest Service is proposing.

Comment: Have as few major intrusions as possible to preserve the area for endangered species.

Response: The WMNF protects TEPS species and habitat and keeps the Forest as free of non-native invasive species as possible (USDA Forest Service 2005a, pp. 2-7 and 2-8). The effects of this project on TEPS/RFSS (Regional Forester Sensitive Species) are described in the Biological Evaluation and summarized in Section 3.16 of the EA.

Some of the vegetation management proposed under both Alternatives would enhance the survival of TEPS/RFSS species. For example, increasing spruce-fir regeneration would increase the abundance of snowshoe hare, which would benefit Canada lynx. Creating openings would provide foraging habitat for eastern small-footed myotis. Some RFSS plant species, such as Bailey's sedge, may benefit from disturbance created by vegetation management and associated activities.

The goal of keeping the Forest free of NNIS (non-native invasive species) is met in the project area by following Forest-wide standards and guidelines for NNIS (USDA Forest Service 2005a, pp. 2-11and 2-12). Refer also to the NNIS section in this EA (Section 3.6).

Comment: Please describe any microclimate conditions (such as rich woods and other microclimates often associated with rare plants) found in the project area. What survey methodology was used to discover them? What effect will the proposed action (including efforts to increase the amount of sunlight; harvest activities and road building and maintenance) have on these unique climatic conditions?

Response: We do not describe microclimate conditions in the EA but we search for outstanding natural communities and rare plants which might occur as a result of a microclimate condition. The field reconnaissance section of the BE describes results of field surveys for plants and outstanding natural communities in the Mill Brook project area. Results from an unpublished botanical survey found that most of the project area has low potential for rare plants, although there are a few areas of slight enrichment with a moderate probability of rare plants. No TEPS/RFSS plant species were observed in the project area. The Habitats of Concern portion of the Wildlife Report in the project file and the Wildlife section of the EA describe the sources of information used to identify outstanding natural communities in the project area, although none exist.

Comment: The Forest Service should not log the oldest stands in the area and should retain them to provide future old growth forest. The White Mountain National Forest should serve as a refuge for late-successional species.

Response: The WMNF provides a large acreage of mature forest occupied by species that use late successional habitat for all or part of their life cycles. The large preponderance of lands on the national forest (approximately 90%) provide mature and old habitat (USDA Forest Service 2005b, p. 3-85).

Analysis of the Mill Brook HMU indicates approximately 86% (7,776 acres/9,083 acres) of the 2.1 land in the HMU is in the mature age class. Some mature forest habitat will move toward old growth over time on MA 2.1 lands that are unsuitable for timber harvest such as steep and/or rocky terrain (approximately 1,805 acres in the Mill Brook HMU) and on lands outside MA 2.1 that are not subject to timber harvest (MA 6.1, 6.2 -- approximately 7,902 acres).

There is no known old growth habitat in the Mill Brook HMU as defined by the Forest Plan (USDA Forest Service 2005a, Glossary, page 21). The oldest stands in the HMU have an estimated year of origin of 1851 making them 156 years old. A stand must be at least 200 years old to be considered old growth along with certain other criteria described in the Forest Plan. There will be no increase in old growth forest in this HMU within the next 15 to 20 years under any Alternative.

Comment: What are the results of your bat (particularly Indiana bat) monitoring, evaluation and survey in and around the project area? What survey methodology was used to find bats, including Indiana bats in the project area? When was the survey conducted? Has any survey occurred at a time to maximize the chances of finding a maternity colony? Compare the proposed seasons of harvest and herbicide application with both the recorded and likely seasons of bat presence. What species of bat do you expect would benefit from the proposed actions in the project area and the change in age class to early successional? Which species would suffer from the proposed action? Which of the species positively and negatively affected are on the RFSS and TES lists?

Response: The BE describes specifics about multi-year bats surveys that have been conducted on the WMNF. It also describes habitat reviews that were conducted in the project area. Mature forest and riparian habitat in and adjacent to the project area may provide some characteristics needed by Indiana bat for summer habitat, such as large exfoliating trees near streams. However, recent research in northern New England indicates most of the WMNF is unsuitable for Indiana bat due to high canopy closure of forested habitat, cooler temperatures and steep terrain between and distance from known winter hibernacula (USDA Forest Service 2005b, Appendix G, pp. G-35 through G-44). Indiana bat was not listed as present on the WMNF in a recent letter from the USFWS, which provided information on presence of federally listed and/or proposed threatened or endangered species on the White Mountain National Forest (USFWS 2006). The BE describes potential for occurrence and effects on eastern small-footed myotis, a RFSS species).

Comment: Please provide the most current RFSS list in the EA and detail survey methodology for each species. What are the results of your monitoring, evaluation and survey for avian, TES and RFSS species, MIS, goshawks, Indiana bat, Canada Lynx, wildlife and small whorled pogonia in and around the project area?

Response: The most recent RFSS list is included in the Biological Evaluation (BE) in the project file. The BE and the Wildlife and TES Sections of the EA (Sections 3.15 and 3.16) describe results of local and Forest-wide monitoring surveys (including plants) and field reviews for species and/or habitats that are known to occur or have suitable habitat in the project area.

Monitoring guidelines for wildlife are defined in Chapter 4 of the Forest Plan (USDA Forest Service 2005a) and the Forest Plan Monitoring and Evaluation Guide (USDA Forest Service 2006). Monitoring of habitat condition and Management Indicator Species are done at a Forest-wide level. Past results of monitoring are in the annual forest monitoring reports (USDA Forest Service 1993, 1994, 1995, 1996, 1998, 1999, 2000, 2006e).

General Comments

Comment: "logging causes terrible erosion… it causes heat islands. it is anti environmental to the nth…you show a washed out section of road. it is no wonder if you are cutting out trees. each tree holds about 40 gallons of wate so when you cut a swath of trees, you are unleashing much water on the surrounding area."

Response: Early logging practices cause did cause erosion, but we apply many protective measures -- standards and guidelines, Best Management Practices, design features, and timber sale contract provisions – that minimize risk of erosion from vegetation

management projects. Section 3.10 discloses the effects to soils, and all of Chapter 3 is devoted to disclosure of our project proposals, including timber harvest, on natural, cultural, scenic, and socio-economic resources.

As for water yields in regard to harvesting, research has shown that removal of vegetation through timber harvest can alter evapotranspiration rates. These altered evapotranspiration rates result in changes to streamflow depending on the extent of change to the vegetation (Hornbeck, et al 1997). Research at Hubbard Brook indicates that as reductions in basal area approach 25%, a measurable response in annual water yield, may be seen (Hornbeck et al., 1993). For this project, none of the subwatersheds will have more than 25% basal area removal so no measurable increases in water yield should occur. See Section 3.12 for more detailed effects of timber harvest on water quantity.

Comment: "…asked why the project is not "twice as big" and felt in general that the Forest could or should be harvesting more timber (not necessarily clearcuts)."

Response: The original Mill Brook Vegetation Management Project sent out to the public in March of 2006 called for approximately 2,300 acres of treatment. Court rulings later the same year prohibited timber harvest and road construction from occurring on inventoried roadless lands (as identified in 2001) of national forests across the country. As a result, the Mill Brook VMP was scaled back to its present day acreage of just over 1,000 acres.

Comment: "…asserts that climate change will accelerate if the current rate of forest loss continues. The Northeast, like the rest of the country, faces accelerating deforestation because of residential and commercial development. Harvesting trees faster than they grow back not only reduces the amount of carbon dioxide forests can pull from the air; it adds to global warming because, as wood is processed, burned or breaks down, it releases most of its carbon into the atmosphere…The forest service must do its part to combat global warming. The project as proposed does not do so…"

Comment: "logging causes…heat islands.

Response: We agree that forests play a role in mitigating global warming, although the Mill Brook project will have an immeasurable effect on warming; and hence the issue was not considered in detail in the analysis. In particular, alternative treatment cycles were not considered, as growth and yield models that support harvest decisions do not reflect climate change – and are not likely to, for the foreseeable future, given the uncertainties in ecological and climate modeling (Shugart and others 2003: 5, 24-27). Furthermore, while foregoing harvest may have a short-term effect in the amount of carbon stored in the forest, over the long term a continuous cycle of harvest, efficient use of biomass and re-growth can sequester more carbon (Birdsey and others 2000: 114).

Global warming issues are most appropriately addressed at the policy scale, not at the project scale, as emissions from anywhere in the world mix in the atmosphere and affect climates everywhere. The Forest Service does participate at the policy level; for instance, through participation in climate science research on adaptation options for climate-sensitive ecosystems (U.S. Environmental Protection Agency USEPA. 2007b), and research on a variety of other climate change topics (USDA Forest Service 2007c). It also provides carbon offset opportunities through reforestation programs (National

Forest Foundation 2007). Most importantly, management of the National Forest System contributes to mitigation of climate change.

In the United States, improved forest management practices, afforestation of previously cleared forest areas (in which eastern National Forests have been active), as well as timber harvesting and use have resulted in net uptake (i.e., net sequestration) of carbon each year from 1990 through 2005. In 2005, land use, land-use change, and forestry activities resulted in a net carbon sequestration of 828.5 Tg CO2 equivalents. This represents an offset of approximately 14 percent of total U.S. CO2 emissions. Total land use, land-use change, and forestry net carbon sequestration increased by approximately 16 percent between 1990 and 2005, primarily due to an increase in the rate of net carbon accumulation in forest stocks (U.S. Environmental Protection Agency 2007a: 7-1). This net accumulation is the result of large-scale changes in land use and management. Sequestration is expected to continue for the foreseeable future, although at a reduced rate because of forest maturation (USDA Forest Service 2007b: 84). Forest productivity may increase (Intergovernmental Panel on Climate Change 2007: 6). While there is uncertainty surrounding projections of increased productivity, largely associated with the effects of elevated levels of carbon dioxide on photosynthesis (the "carbon dioxide fertilization" effect, Shugart and others 2003: 16-20), northern forest productivity may benefit from longer growing seasons and tree migration (Shugart and others 2003: iv, 44).

Due to improvements in U.S. agricultural productivity, the rate of forest clearing for crop cultivation and pasture slowed in the late 19th century, and by 1920, this practice had all but ceased. As farming expanded in the Midwest and West, large areas of previously cultivated land in the East were taken out of crop production, and were allowed to revert to forests or were actively reforested. The impacts of these land-use changes still affect carbon fluxes from forests in the East. In addition, carbon fluxes from eastern forests have been affected by a trend toward managed growth on private land. Collectively, these changes have nearly doubled the biomass density in eastern forests since the early 1950s. Forest management affects the net flux of carbon by altering the amount of carbon stored in forest ecosystems. For example, intensified management of forests can increase both the rate of growth and the eventual biomass density of the forest, thereby increasing the uptake of carbon (USEPA 2007a: 7-5).

Even the removal of forest products does not contribute carbon to the atmosphere to the degree many people believe. The advent of sealed landfills in the 1980s has resulted in an increasing rate of carbon accumulation in landfills, which counts as stored carbon (USDA Forest Service 2007b: 84-85; USEPA 2007a: 7-4, 7-5 & 7-6). Because most of the timber harvested from U.S. forests is used in wood products, and many discarded wood products are disposed of in sealed landfills rather than by incineration, significant quantities of carbon in harvested wood are transferred to long-term storage pools rather than being released rapidly to the atmosphere. The size of these long-term storage pools has increased in recent years, contributing to the net sequestration of carbon in the forestry sector (USEPA 2007a: 7-5 to 7-7). Finally, the use of wood products in construction may substitute for the use of more carbon-intensive products such as steel and concrete (USDA Forest Service 2007b: 84).

Globally, the picture is similar. Approximately 75% of global carbon dioxide emissions are from fossil-fuel consumption, the remainder is from land-use changes. Much of the land-use change contribution comes from the tropics (USDA Forest Service 2007b:

83). As shown above, forests in the U.S. have been carbon sinks. Significant changes in atmospheric carbon dioxide must come from control of fossil fuel emissions.

Comment: "The portion of New Hampshire timberland that is privately owned is 70%. Conservation easements protect 29% of timberland. Acres of timberland in New Hampshire amount to 4.45 million. The size of the White Mountain National Forest is approximately 780,000 acres. Acres of forest lost to development in New Hampshire each year are between 12,000 and 17,500. It would appear from these facts that there is now a greater responsibility for the White Mountain National Forest to preserve its forest as opposed to harvesting them. The forest service should adjust its goals of harvesting timber to take into consideration global warming and climate change…if the present warming trend continues, New England's Sugar Maples will give way over the next century to a mix of mid-Atlantic hardwoods, predominantly hickory. He stated that climate change will also increase the length of mud season in fall and spring which will impede the work for loggers. The cycle for this project should now be adjusted to twenty-five (25) years."

Comment: The cumulative effects analysis must address the effects of climate change on the purpose and need for the project, particularly on the likelihood of regeneration success for the vegetative species desired.

Response: Changes in forested land area have not, to date, had a noticeable impact on carbon sequestration in the U.S. From the early 1970s to the early 1980s, forest land declined by approximately 2.4 million hectares. During the 1980s and 1990s, forest area increased by about 3.7 million hectares. These net changes in forest area represent average annual fluctuations of only about 0.1 percent. Given the low rate of change in U.S. forest land area, the major influences on the current net carbon flux from forest land are management activities and the ongoing impacts of previous land-use changes (USEPA 2007a: 7-5, Table 7-7).

The pattern is similar in New Hampshire. The best available carbon budgets, covering the period 1987-1997 (USDA Forest Service 2002c) show annual declines in carbon stocks due to land-use change, but much larger annual increases in total carbon stocks, largely due to biomass increases in the "other private" component, with a small increase in the National Forest component. (Note that some of the gain in "other private" is likely correlated with the loss in "forest industry" carbon, resulting from changes in ownership - Birdsey and Lewis n.d.: 9, 15)

At larger scales, as shown in the preceding response, acres lost to development in New Hampshire do not figure in a significant way in the carbon flux. U.S. forest area has been increasing through 2006 (USEPA 2007a: Table 7-7). The majority of the carbon flux is the result of fossil-fuel consumption and tropical land-use change. U.S forests have acted and will continue to act as carbon sinks, and products removed from forest lands are not necessarily converted into atmospheric carbon.

Regarding Sugar maples (Acer saccharum), current models predict a decline in abundance, but not a disappearance (USDA Forest Service 2007a). However, there is variability between model projections, and northern New England may indeed be characterized by oak-hickory and oak-pine forests in the future (for example, see Shugart and others 2003: 13, 21). However, such changes will be controlled by global emissions and climate scenarios, not local project implementation.

Lastly, at this time, it is not possible to predict the impact on "mud season." It may become longer, shift in time, both, or may be reduced (because of increased evaporation associated with some climate change scenarios). In any case, forest plan standards and guidelines will be applied to equipment operation and road use to mitigate impacts on soils, and can be applied or adapted in very short time frames relative to the rate of climate change (USDA Forest Service 2005a Chapters 2 and 3).

Comment: "You are going to do what you are going to do."

Response: Our environmental analysis process is a dynamic and responsive process that includes much investigation, research, and public involvement. As such, we expect to be gaining and responding to new information and issues as the analysis progresses. The Mill Brook project presented to you in this EA is somewhat different from the project proposed in the February 2007 scoping report, and is vastly different than when we started the process in 2006. We cannot say at this time what the final decision will be regarding the Mill Brook project proposal.

Comment: "You haven't mentioned the length of the project"

Response: Timber sale contracts are usually three years in length from the date the sale is awarded, expected to be late summer of 2008. Extensions may be granted to account for extreme weather or market conditions. The wildlife opening maintenance would occur once every 3-5 years, and the watershed restoration projects would most likely be done after the timber harvest and would take 1-2 seasons to complete.

Comment: The scoping letter states: "If you provide substantive comments during the 30-Day comment period, you will be eligible to file an administrative appeal of the Mill Brook Project decision. You will not be eligible to appeal the decision if you respond only to this Scoping Notice." Please provide the legal rationale for these statements and the relevant citation to law or regulation.

Response: The Mill Brook Scoping Report (February 2007) actually states: "Before a decision is made on this project, you will be given the opportunity to comment on the draft Environmental Assessment (30-Day Comment Period). If you provide comments or express interest in this project during the 30-Day Comment Period, you will be eligible to file an administrative appeal on the project's Decision Notice. You are not eligible to appeal the decision if you respond only to this scoping letter." The requirement for "substantive" comments as previously required by Forest Service regulations was removed prior to this scoping effort and replaced by the less stringent requirement for an expression of interest. Our statement regarding eligibility to appeal is consistent with the Appeals Reform Act (ARA) and the court decision in Wilderness Society v. Rey. The ARA directs the establishment of a notice and comment process and states that the agency shall accept comments within 30 days after publication of notice (Section 322(b)(2)). Basing standing on participation in the comment process meets the ARA intent as expressed in the Senate colloquy (http://www.fs.fed.us/emc/applit/includes/appcolloquy.pdf, pp. 2-3: to provide a clearly defined public comment period.). The comment process is defined in 36 CFR 215, which implements the ARA (see 36 CFR 215.6). In Wilderness Society v. Rey, the court severed 36 CFR 215.13(a) from the current regulation, and substituted the language from section 11(a) of the previous version of 36 CFR 215 (Chief's 1570 letter of May 1, 2005). Consequently, an appeal may be filed by any person who has provided comment or otherwise expressed interest in a particular proposed action by the end of the comment period specified in 36 CFR 215.6. Whether the reference is to the current or prior regulation

makes little difference - section 6 of both versions of the regulations defines a comment period, which is necessary to meet the ARA intend of having a clearly defined public comment period. Scoping is a NEPA, not ARA, term and is distinct from comment (see 40 CFR 1501.7 and 40 CFR 1503). Scoping is a flexible process - no single technique is required or prescribed (Forest Service Handbook 1909.15,11), and would not meet the ARA intent.

Comment: The cumulative effects analysis must address the effects of activities on private land.

Response: The project area includes private inholdings which were considered in all cumulative effects analyses (see resource sections in Chapter 3). In addition, particular resource areas (wildlife, vegetation, non-native invasive species, and TEPS) included private land outside of the national forest boundary when considering cumulative effects. See section 3.1 for a description of the private lands considered in the effects analyses, as well as the response in the Wildlife comments above regarding consideration of cumulative effects of activities on private land. There you will see the details on collecting data with respect to private lands.

Comment: The commenter is interested in knowing when the project area was last surveyed to assess stand conditions and how they compare to other areas of the forest.

Response: The project area was assessed by foresters and other members of the interdisciplinary team numerous times during the course of this environmental analysis. Every stand proposed for harvest was visited by resource specialists, and some were visited by the public as well. Field visit notes, survey results, datasets, GIS shapefiles, and all other supporting documentation regarding assessment of the stand conditions, landings, roads, streams, soils, scenery, wildlife and wildlife habitat, heritage resources, aquatic habitat, and recreation use are in the project file and incorporated into the affected environment and effects conclusions in Chapter 3.

Comment: "Sales History…facet of assessing whether local markets can compete successfully for national forest timber sales is to look at past history. Over the last 5-year period, how many sales has the White Mountain NF offered? What companies have won the bids for these projects? Are they local companies?"

Response: Forty-two timber sales have been offered on the White Mountain National Forest from FY 2003 to FY 2008. The list of purchasers is represented by a variety of lumber, pulp & paper and logging companies from Maine, New Hampshire and Vermont. An analysis of market conditions can be found in chapter 3 of the Final Environmental Impact Statement completed for the 2005 Forest Plan (USDA-Forest Service, 2005b, pp 3-120 to 3-121). Further information on commercial wood production in the region can be found on pages 3-496 to 3-498 of the FEIS.

Comment: "Timber Sales and the Determination of Cumulative Effects: How many separate timber sales and payment units do you expect from this project? What is the average number of sales and payment units for a project of this size on the forest?"

Response: Two timber sales (one sale combined with payment units created from the neighboring North Kilkenny project, approved in May 2007) with 19 payment units would be generated from the proposed action.

Comment: We believe alternatives should be created to respond to the following issues: timber harvest in the Kilkenny IRA; road authorization in the project area; even-aged harvest in the project area. There should be no timber harvest, road building, or road authorization in the project area; no reclassification of unauthorized roads to Forest Road, and no-even-aged timber harvest.

Response: Part of the environmental analysis process is to identify significant issues related to the proposed action, from which alternatives may be developed to address the issues. Section 1.4 describes the identification of issues in this analysis. Alternative 3 addresses the issue related to proposed activities in the IRA (Section 3.5). We also considered a no-even-aged-management alternative but did not fully analyze it, as discussed in Section 1.5.

In response to the request for an alternative in which no unauthorized roads would be designated as Forest Roads: one of our goals is to decommission unneeded roads throughout the Forest (USDA-FS, 2005a, p.1-17), while maintaining a road system that is safe, affordable, responsive to public needs, meets vegetation, wildlife, and other management goals, and has minimal adverse ecological effects. The analysis of roads in and around the project area considered all of these factors.

It would not be prudent management to defer decisions regarding the designation or decommissioning of unauthorized roads further into the future. Making such decisions at this time will ultimately protect resources (see discussions of road maintenance in the Soils and Water Quality sections) and save taxpayer dollars by maintaining necessary roads and closing unneeded roads.

In the Mill Brook project area we would be decommissioning more miles than we would be designating:

- A total of 2.42 miles of roads in national forest jurisdiction would be decommissioned.
- A total of 2.20 miles of roads in national forest jurisdiction would be reclassified from unauthorized to Forest Road. Of these miles, all but 0.2 miles would be assigned to Maintenance Level 1, a basic custodial level of maintenance on intermittent-use roads, designed to protect resources when the road is not needed for active management.

Comment: "I believe…the Millbrook Vegetation Management Project (is an) unwarranted and needless intrusion into the existing structure of the White Mountain National Forest.

Response: We believe that this project is necessary to move this area toward a desired future condition. From Purpose and Need, Mill Brook Scoping (page 3): The purpose of this project is to accomplish resource goals and objectives to meet the overall management direction of the White Mountain National Forest as established in the Forest Plan.. In particular, the project was designed to move the Forest toward habitat composition and age class objectives for Management Area (MA) 2.1 (USDA-FS 2005a, p.1-21) and to help achieve the following goals for MA 2.1:

- Provide high quality saw timber and other timber products on a sustained yield basis.
- Provide a balanced mix of habitat for wildlife species.

- Continue to maintain and update the Forest road inventory through monitoring and field verification.
- Manage streams at proper functioning condition to dissipate stream energy associated with high water flows, thereby decreasing erosion, reducing flood damage, and improving water quality.
- Protect, restore, or improve riparian area conditions to benefit riparian dependent resource values.

Please refer to Chapter 2 of the EA for discussion on alternatives to the proposed project and Chapter 3 for the resulting effects.

Comment: "…I feel that additional logging at this time in unwarranted based on the current status of the timber market."

Response: Stumpage prices for the northern region of New Hampshire reflect relatively little change in price from October 2006 through the spring of 2008. The only decline for the various products to be harvested from the Mill Brook project is that of $25.00/Mbf (6%) in the highest price offered for sugar maple. All other species and products have remained the same or improved slightly over the same time period (NH Department of Revenue Administration 2007).

Timber sales on the WMNF are three-year contract periods. This provides a measure of time to sell harvested products at premium prices, if so desired. Markets for forest products throughout northern New England have historically been subject to a wide range of factors from local concerns of extended periods of rain, snow and mud, mill closures and openings to the far ranging impacts of competition from Canadian and overseas markets. Recent mill closures in Berlin and Groveton, NH are expected to be offset somewhat by the proposed construction of one of the largest biomass-energy facilities in the country at the former Berlin mill location (Laidlaw Energy Group 2008).

Any change in markets has yet to impact the value received for forest products from the WMNF. Bid premiums (the amount by which the Purchaser's bid is in excess of the advertised price) for the last five sales offered in the Kilkenny area (dating back to 2003) have averaged no less than 30% of the offered price (Report of Timber Sale data, project file).

Appendix C: Comments and Responses to 30-Day Comment Period for the Preliminary EA

The Preliminary EA was available for public review and comment from The interdisciplinary team reviewed each comment received during the 30-day comment period and considered all project-specific comments, questions, and new information. They are listed in this section with Forest Service responses by the interdisciplinary team.

Along with project-specific comments, some respondents sent questions, observations, suggestions, and requests for information that were not relevant to this project-level analysis. This latter group of comments is not responded to in this document. Respondents who have Forest-level questions or concerns should contact the Forest or other resources separately on those topics.

Comments are listed as either direct quotes or paraphrased. Every effort has been made to accurately retain the context and represent the points of view expressed by each commenter. All correspondence is filed and available for public inspection in the Mill Brook Project File located at the Androscoggin Ranger Station in Gorham, New Hampshire.

We appreciate the time all respondents spent reviewing and commenting on the Mill Brook Project Preliminary EA. Thank you for your thoughtful comments.

Comments and responses are grouped by topic as follows:

1. Project Support
2. Fish and Aquatic Habitats
3. Heritage Resources
4. Inventoried Roadless Areas
5. Socio-Economic Assessment
6. Soils
7. Transportation System
8. Vegetation
9. Wildlife
10. Preservation
11. Climate Change

1. Project Support

Comment: The commenter supported the whole project, stating that there is timber being wasted in the national forest and he hates to see it go to waste.

Comment: The commenter supports the project because it contributes to an important part of New Hampshire's economy (the forest products industry) while "providing wildlife habitat and many other benefits for citizens from New Hampshire and beyond." The commenter goes on to say that the Mill brook Project demonstrates the best principles of multiple use.

2. Fish and Aquatic Habitat

Comment: The commenter quotes a draft version of the Fish and Aquatic Habitats paper and a silvicultural prescription regarding protective measures assigned to streams in Stands 2-30, 2-45, 2-59, and 2-34d which state "Design features will ensure that any group selection occurs at least 50′ away from these stream channels. Harvesting within 50′ would leave a well distributed stand of trees," and "Forest Plan standards and guidelines for perennial streams would be applied to the un-named tributaries in Stand 2-30.Where present, retain numerous trees along

intermittent streams to provide direct bank stabilization and shading." He visited Stand 2-30 and, noting trees marked along the bank, asks if we are not providing the stream protection assigned and also required by Forest Plan Standards and Guidelines.

Response: The report quoted by the commenter differs somewhat from the Preliminary EA. The streams previously referred to as "un-named tributaries" are described in the Preliminary EA as two particular streams, Peps Brook and Pucci Brook, flowing from the east into Mill Brook (see Section 3.3). The lower reaches of Peps Brook and Pucci Brook have perennial characteristics. The Design Feature to apply perennial stream protection (which is incorporated into the silvicultural prescription) is intended to address those two particular stream segments only, not all unnamed tributaries (which are intermittent) in Stands 2-30, 2-45, 2-59, and 2-34d. The wording has been clarified in Section 2.5, Design Features.

The stream observed by the commenter is not one of the segments identified as a perennial stream; however it is protected through the silvicultural prescription requirement to retain trees for bank stability and shade.

3. Heritage Resources

Comment: The commenter notes that the project area appears to include all or part of Mill Mountain, which has remnants of the former fire tower. It would be too bad to impact the site, and it would be nice to have a display panel about fire towers at South Pond parking area.

Response: The Mill Brook project will not disturb the former Mill Mountain Fire Suppression Lookout site. We are currently working on prioritizing heritage sites on the White Mountain National Forest for possible interpretation, however because the Mill Mountain Fire Lookout was a secondary lookout and existed for a relatively short time, it is unlikely that it will rank high in the future interpretive efforts of the forest.

Comment: "What survey methodologies were used to search for prehistoric sites in the project area? Was shovel testing used and if so how many shovel tests were completed and where did they occur?"

Response: A sample survey method was used for the Mill Brook project area. After pre-survey research, the District Heritage Resource Paraprofessional consulted with the Forest Archaeologist on which areas to survey. Areas with some probability of historic or prehistoric sites were walked. This is our primary survey technique and is accepted by the New Hampshire Historic Preservation Office. The topography and the harvest area locations indicate that any sensitive areas for prehistoric use would not be impacted by project activities, and as a result, no shovel testing was undertaken.

Comment: "We would like a copy of CRRR #06-2-3, associated field notes, and any programmatic agreements with SHPO regarding survey methods and Section 106 compliance."

Response: Due to the sensitive information contained in the report and in compliance with Forest Plan direction, the Archaeological Resources Protection Act of 1979 (Section 9), and 36 CFR 296.18 (Confidentiality of archaeological resource information), the report will not be released, however it is available for viewing at our Laconia and Gorham offices with arrangements made in advance. We received written concurrence on our survey results and mitigations from NH SHPO on 8/29/06. Field

notes were made on field report and site forms while surveying. Field forms were discarded when all of the information was transferred into the final resource report. No programmatic agreement exists between the NH SHPO and the White Mountain National Forest regarding survey methodologies. Our Forest survey strategy is referenced in the Forest Plan (USDA Forest Service 2005a, p. 2-7, G-3) and is located in the project file.

Comment: The commenter wishes to receive documentation "of the failure of each of the identified sites in the project area to meet National Register criteria…."

Response: We did not evaluate sites in the project area for eligibility for the National Register of Historic Places. As stated in Section 3.4 of the EA, "There are no known heritage resource sites in the project area that are eligible or are being evaluated for the National Register of Historic Places, nor were any pre-historic cultural resource sites identified." The backlog of unevaluated heritage sites is addressed by our Forest Plan Standard (S-2) found on page 2-7, which states in part:

> *All proposed undertakings must consider the effect on any National Register listed, eligible, or un-evaluated heritage resource within the Area of Potential Effect (APE) prior to project implementation. The Forest Service must manage properties found to be eligible for National Register listing, or which remain un-evaluated, as if they were listed on the National Register of Historic Places.*

The cultural resources report (CRRR #06-2-3), the effects analysis in the EA, and our project implementation plans meet this requirement regarding un-evaluated heritage sites.

Comment: "We notice in reviewing the Institute for Research Construction, Construction Technology Update #39 (listed in the EA at pg 31) that it is focused on vibration impacts to more modern and new construction and does not discuss effects on historic properties."

Response: The referenced research paper does not differentiate between older and more modern buildings, however it does note that *"the predominant frequencies and amplitude of the vibration depend on many factors including the condition of the road; vehicle weight, speed and suspension system; soil type and stratification; season of the year; distance from the road; and type of building. The effects of these factors are interdependent and it is difficult to specify simple relationships between them."* Any negative vibration impacts potentially caused by vehicle weight and the church's proximity to the road may be alleviated by other factors such as winter haul, slower speeds in the village, and the regularly maintained road surface, all of which have been shown to reduce traffic vibrations. Additional research in England indicates that traffic vibrations do not cause structural damage to historic buildings, and that vibration levels near roads with even surfaces such as Route 110 were higher in upper walls than foundations (Hume 1995).

As the analysis in Section 3.4 indicates, the buildings along Route 110, including the Stark Village Church, have experienced decades of traffic, including a variety of heavy trucks. Current traffic through Stark averages 1,800 vehicles, including 56 heavy trucks, every weekday. In addition, loaded freight trains pass within 500 feet of the church twice daily. There is no evidence that any of this activity has significantly affected the church. As indicated in Section 3.4, it is therefore unlikely that the addition of less than one log truck per day (on average), with the majority of the hauling done in the winter when potential for vibration effects are lowest, would adversely affect the church. We

considered as many factors as possible as well as the best available science in coming to the conclusion that the Mill Brook project will not damage the church.

4. Inventoried Roadless Areas

Comment: The commenter states that "the 'Kilkenny Inventoried Roadless Area' was only intended to be an analysis tool in the planning process. The plan has been approved and that tool is no longer needed. In addition, we see no reason why any of the proposed actions would have any effect on the character of an inventoried roadless area or Scenic River designation. No new roads are proposed and all other activities are temporary in nature."

Response: As described in the EA in Chapter 3.5, inventorying roadless areas is part of the forest planning process intended to identify and evaluate areas for potential Wilderness designation. IRAs are not management areas. The effects of harvest and other activities on the roadless inventory criteria used to identify the Kilkenny IRA are disclosed in Chapter 3.5.

Comment: "We would note that in our review of the new WMNF Plan, there is nothing in MA 2.1 that requires the Forest Service to do the proposed logging and road reconstruction in the IRA. The Forest Service has the option to forgo these activities if it thinks the area's values should be protected. In this case, the values of this area are not fully discussed in the comment package, however the roadless character and potential wilderness designation should be sufficient justifications to fully develop a better alternative that does not log or build roads in the IRA."

Response: We agree that the site specific authorization for the Mill Brook project is not required by the Forest Plan. As described in the EA in Chapter 1.1, the Mill Brook project addresses site-specific resource conditions related to vegetation, wildlife habitat, riparian and aquatic habitat, water resources, and transportation in the project area. The purpose and need for this proposal is grounded in field work by local resource specialists, monitoring data, professional experience with similar actions, and the best available science. The commenter is correct in that the Management Area designation in the programmatic land management plan does not authorize site specific action in this area. The Plan does, however, set forth a broad framework to guide future actions, including the desired future condition. This desired outcome was result of years of collaborative effort from a diverse group individuals, organizations, and government entities. The Mill Brook Project was designed to be consistent with the Plan's articulation of the desired condition for this Forest during this planning cycle. See The Record of Decision (USDA Forest Service 2005c pp 8-15) and the preface of the Forest Plan (USDA Forest Service 2005a p. v).

The characteristics of the Kilkenny Inventoried Roadless Area are summarized in the Affected Environment section of the EA (Section 3.5). This description of the Area is based on site specific field work. This site specific analysis tiers to the evaluations described fully in Appendix C of the 2005 FEIS for the Forest Plan (USDA Forest Service 2005b; p. C-92 – C-100). Together, Plan and project documentation provides a description of the action in the context of the broader Forest landscape. The EA describes how proposed site specific actions would affect the land in terms of pertinent inventory and evaluation criteria (Section 3.5).

In response to comments during the project's scoping period and presented in the Preliminary EA (Section 2.3), the IDT developed and analyzed Alternative 3 in which

no timber harvest or road work would occur in the Kilkenny IRA. The analysis also evaluates the effects of deferring all activities at this time (Alternative 1, No Action). The IDT examined several other alternatives (Section 1.5) suggested by the public and discusses the potential of these suggested alternatives to achieve the purpose and need for the action. As a whole the range of alternatives considered by the IDT provides the basis for informing the public and the decision-maker regarding the environmental trade-offs associated with taking action at this time.

Comment: "We urge the Service to conduct such analysis keeping in mind the special character of roadless areas, and to choose an alternative that does not invade such areas or damage their roadless character. Roadless character describes those characteristics most often present in inventoried roadless areas, which encompass: unique opportunities for dispersed recreation, sources of clean drinking water, and large undisturbed landscapes that offer privacy and seclusion. In addition, these areas provide a bulwark against the spread of nonnative invasive plant species, support a diversity of habitats for native plant and animal species, conserve biological diversity, and provide opportunities for study, research, and education. (2001 Roadless Area Conservation Rule FEIS, p. S-1, available at <roadless.fs.fed.us/documents/feis/>).

"These are unique and ecologically important areas, the protection of which should be forefront in the planning process. For these reasons, an alternative that does not build roads or log within the IRA should be adopted."

Response: This comment describes a general list of environmental characteristics or qualities (paraphrased from the description of roadless areas values and characteristics in the 2001 Roadless Area Conservation Rule (RACR) (Federal Register / Vol. 66, No.9 / Friday, January 12, 2001 / Rules and Regulations / p. 3245)) which broadly describe certain aspects of land conditions found in many different roadless areas nation-wide. These characteristics were specifically developed for a national evaluation and rulemaking effort, and are not part of any current regulation governing project-level environmental analyses. While instructive, these characteristics do not control or govern the environmental analysis for site specific environmental analyses.

A key part of understanding this environmental analysis involves distinguishing between RACR and the inventoried roadless analysis process undertaken as part of Forest planning. The 292-acre portion of the Kilkenny IRA involved here is not a RACR roadless area. A detailed discussion of the critical differences between the RACR process (a nationwide rulemaking effort to identify roadless areas) and the subsequent forest plan revision process (USDA Forest Service 2005b Appendix C) for identifying roadless areas is in the project record. The comment acknowledges the significant differences between the RACR and the plan revision IRA, and yet argues that these processes should be merged. This is not required by law, nor is it wise public policy. The RACR process has concluded with the identification of RACR areas based on certain factors identified in the national rule. The roadless area identification process undertaken during Plan revision is likewise concluded. As this project is not located within a RACR area, there is no purpose in using the RACR factors (en lieu of Forest Plan's Final Environmental Impact Statement, USDA Forest Service 2005b, Appendix C) in evaluating site specific environmental effects.

The eight IRA inventory criteria from the Forest Service Handbook (1909.12 chapter 71) and four wilderness evaluation criteria from the 2005 FEIS for the Forest Plan (USDA

Forest Service 2005b, Appendix C) in Chapter 3.5 of the project EA provide a foundation to determine whether proposed activities would be of the intensity or duration to preclude meeting baseline criteria for inclusion in a future roadless inventory, as well as whether activities would preclude lands from possible future recommendation as wilderness or other allocation. Additionally, the EA discloses the effects on other resources such as wildlife habitat (Sections 3.15 and 3.16), recreation (including opportunities for solitude (Sections 3.5 and 3.7), water quality (Section 3.12), invasive species (Section 3.6), and diversity of plant and animal communities in a multiple use context (Sections 3.11, 3.15, and 3.16). The commenter does not provide any information concerning environmental effects overlooked or ignored by the IDT.

Our 2005 evaluations of the overall existing resource condition of the Kilkenny IRA (USDA Forest Service 2005b, p. C-100) found that the area "does not meet criteria regarding unique characteristics, nor does it contain any key attractions not adequately represented in other Wilderness areas or nearby protected areas. Equally important, the past harvest activities in this IRA did not preclude its consideration as wilderness. Other areas on the Forest have experienced harvesting similar to that proposed here and later been designated as wilderness. This fact provides strong evidence that the environmental effects of the actions proposed here are short term, limited in scope, and non-significant. As illustrated by past activity, with mitigation and careful project implementation, effects soon fade into the landscape. The Kilkenny IRA will retain its potential to be recommended as wilderness.

The environmental trade-offs associated with the proposal are clearly set forth in the record: as requested by this comment, the Forest took a hard look at implementation of the project outside of the IRA (Alternative 3 proposed no harvest or road maintenance in the Kilkenny IRA). The project's predicted effects to resources in the Kilkenny IRA are described in detail in Section 3.5 of the EA, and were considered carefully prior to the decision to select Alternative 2.

Comment: The commenter states that the project will have a significant effect on the roadless character of the Kilkenny IRA and therefore an EIS must be prepared, citing an earlier version of the Forest Service Manual (FSM 7712.16b, 66 Fed. Reg. at 3236, January 12, 2001), and stating that although the direction no longer exists, an EIS should be prepared because of "unique characteristics represented in the Kilkenny IRA, it will be highly controversial, and it will set a precedent that requires the type of in-depth analysis that only a full EIS can provide. 40 CFR § 1508.27."

Response: As acknowledged by the commenter, the guidance requiring an EIS for proposals in IRAs no longer exists. Rather, we are obligated to determine whether or not any proposed action could, or will, have a significant effect on the human environment. The obsolete guidance quoted in this comment is no longer applicable.

The Mill Brook EA documents our thorough analysis of environmental effects on the Kilkenny IRA (Chapter 3.5). As stated in the EA, this analysis was based on specific, pertinent criteria found in the Forest Service Handbook (FSH 1909.12, Chapter 71.12) and the FEIS for the Forest Plan (USDA Forest Service 2005b). The EA clearly displays the direct, indirect, and cumulative effects of each alternative against these criteria (Section 3.5). Results of the analysis show that lands in the IRA affected by this project would continue to meet inventory criteria and could be considered for any land use option — including recommendation for wilderness — in the future. The Deciding Official determined that none of the proposed alternatives would substantially alter

the undeveloped character of a roadless area, nor would they constitute a major federal action that would result in significant effects to the human environment; therefore an EIS is not required. It is important to note that the project involves only 292 acres (0.08 percent) of the 37,096-acre IRA.

The environmental analysis is informed by field data and observation from local resource specialists and experience with similar projects. The comment asserts that the project will have significant effects, but provides no evidence of any environmental effect ignored or overlooked by the IDT. The Team assessed the existing resource conditions (based on field work), examined various alternatives for moving the project area towards the desired future condition, and disclosed the environmental effects and trade-offs of those alternatives. Public involvement was a key part of project development. Based on the analysis documented in the project record, the IDT reasonably concluded that the project will not have significant environmental effects, particular with regard to a possible future wilderness recommendation.

The comment suggests that the effects are significant because they are "highly controversial," 40 CFR 1508.27(b)(4). Controversy as used in the context of the NEPA regulation refers to a substantial dispute concerning the size or nature of a project's environmental effects, not simply public opposition to a proposal. The project record must be viewed as a whole; simply focusing on certain narrow aspects of the effects disclosure is inappropriate. Allowing bare opposition to a project to suffice as controversy opens this action to be potentially controlled by one person without consideration of science, facts, or other supporting information.

The comment presents no evidence for the existence of a substantial dispute concerning effects. There is no indication here a disagreement exists within the relevant technical, scientific, or other communities so that the IDT could not rationally analyze environmental effects. Even if such a disagreement existed, there is nothing provided by the comment with regard to effects or information ignored by the Team. To the contrary, the scope of the environmental analysis, the methodology used, the data and field work underlying the decision are all carefully documented in the record. The evaluation of resources in this circumstance is based in large part upon local resource specialists – agency experts – and their work on the ground in the project area. The reliance upon this information is woven throughout the disclosure of effects, see, e.g. EA, Chapter 3. NEPA does not demand unanimity regarding effects in order to support a FONSI. Regardless, there is simply no information provided to support the allegation of a dispute concerning the size, nature, or effect of the project. This is particularly true with regard to the effects on the Kilkenny IRA. The IDT has listened to the public, considered alternatives suggested, and explained or clarified the discussion of effects. The effects of this proposal are not highly controversial within the meaning and context of the NEPA regulation and there record supports a finding of non-significance.

Section 3.5 of the EA shows that the proposed action does not establish precedent for a future action with significant effects, nor does it represent a decision in principle about a future consideration with regard to the IRA or other areas of the Forest. See 40 CFR 1508.27(b)(6). The purpose of and need for action in any project are determined by site-specific resource conditions for the project area, which includes 292 acres (0.08 percent) of the 37,096-acre Kilkenny IRA. As noted previously, the purpose and need was developed following Plan revision by resource specialists based upon monitoring information, field data, and professional expertise concerning local resource conditions. The specialists walked the ground to understand the particular

resource attributes and conditions within the project area, and consulted with other resource experts within the agency as needed. Their work was guided by Forest Plan Management Area allocation, goals and objectives, and standards and guidelines in an effort to achieve the desired condition of the land developed with the public during the Plan revision process (EA, Chapter 1; see also the Record of Decision (USDA Forest Service 2005c, pp 8-13).

Comment: The commenter states that the analysis should focus on unique roadless characteristics. In addition, the effects of skid roads and trails and impacts on soils, naturalness, and water quality should be addressed because skid roads and trails could degrade the IRA. Also, the effect on wilderness character of the Kilkenny IRA needs to be addressed because the proposed activities would degrade opportunities for solitude, it would effectively reduce the size of potential "wilderness" quality land of the Kilkenny IRA, and it has the potential to affect the ecological, scientific, and scenic features of the area.

Response: The EA in Section 3.5 considers the effect of timber harvest, skidding, and maintenance of existing roads on specific wilderness evaluation criteria including natural appearance, natural integrity, and opportunities for experiences often unique to wilderness including solitude. The analysis documents the hard look taken by the IDT in their analysis of potential environmental effects upon the resource conditions of the Kilkenny IRA. The EA (Sections 1.3 and 1.4) recognize the character of the IRA as a key issue in the analysis. The IDT examined existing conditions (EA, Section 1.1) and the effects of vegetation management and associated activities upon various attributes of the IRA.

The context here is very important to understanding effects. More than half (53 percent) of this 796,800 acre Forest is allocated to providing for experiences within unroaded landscapes. These lands are managed to protect the primitive, semi-primitive, and non-motorized attributes and experiences. The IRA encompasses 37,096 acres in total, with just 292 acres – less than 1% - of the IRA proposed for management under Alternative 2. The comment concerns significance of effects on a very small portion of the Forest.

Equally important, the effects on resources in the IRA are relatively short-lived. The application of standards and guidelines, Best Management Practices, and project design features insures that the effects on soil, water, air, and wildlife associated with harvesting and road maintenance are not significant. Regeneration occurs rapidly on these sites. The lands that comprise the White Mountain National Forest (even those recently designated as Wilderness) have a long history of active vegetation management. Past harvesting in the IRA has not diminished its character or the quality of recreation experience. There is no information provided in this comment to show that any "unique" characteristic of the IRA will be irreparably harmed or lost. Although there will be some short-term effects (EA, section 3.5), the magnitude and duration of these effects will be limited by mitigation. The long term benefits to forest health and wildlife habitat diversity exceed the short term effects. There is no evidence given that any effects on the characteristics of the IRA are significant. These lands have been subject to active management in the past and recovered. The concern that the proposed management will affect the unique quality of the IRA so that the opportunity of the entire IRA to be recommended as wilderness will be forever lost is without foundation.

All skid roads and skid trails are temporary in nature and used, maintained, and closed using best management practices to protect resources. The soils and water resources sections (3.10 and 3.12, respectively) analyzed the effects of all project components, including skidding, timber harvesting, and road work on those resources. The IDT specifically considered the potential effects on the naturalness and water quality associated with skidding logs (EA Sections 3.5, 3.10, and 3.12). It is important to remember that the roads proposed to be used for vegetation management in this project already exist, i.e. they were constructed in the past. These roads have seen periodic use over many years for logging, recreation, and other activities. Road maintenance (removal of brush, cleaning of ditches) will be performed prior to use. Only 0.2 miles of such maintenance is proposed within the Kilkenny IRA (Alternative 2). There is no road construction or reconstruction proposed under any of the alternatives.

Comment: "While the Preliminary EA does discuss the wilderness evaluation criteria, it does not go on to discuss the wilderness characteristics set forth in *California v. Block*, **690 F.2d 753 (9th Cir. 1982). This case sets forth the principle regarding an agency's obligation to consider wilderness characteristics and values before logging a roadless area."**

Response: The case referenced in this comment was a 1982 Circuit court decision concerning a nation-wide environmental impact statement prepared in 1979 for the Roadless Area Review Evaluation ("RARE II"). This national EIS sought to allocate 62 million acres of National Forest System lands across the country into three planning categories: Wilderness, Further Planning, or Non-wilderness. For areas designated non-wilderness, the Forest Service could consider development proposals for which subsequent NEPA would be done. In this national EIS, the agency did not look at the detailed Forest-level analysis of the effects of the non-wilderness designation. The Circuit's decision rests upon a lack of specificity in the analysis and the concern that the national EIS constrained the agency from subsequently considering wilderness preservation as an alternative to development.

California v. Block involved a nation-wide land evaluation and was not related to site specific analyses such as Mill Brook Project. As described below, the potential of land in the project area for study as wilderness was completed in the 2005 FEIS (see Appendix C). The Circuit did not hold in California v. Block that the IDT must revisit the land allocations made during Plan revision every time is proposes a project. Instead, Block involved an attempt to evaluate and designate land for development at the national level so that this issue would not have to be considered during the forest planning process. The Ninth Circuit clearly expected that consideration of potential wilderness designation would occur as part of the development of the Forest-level land and resource management plans. Indeed, the White Mountain National Forest recently completed the inventory and analysis process contemplated in Block as a part of Plan revision. California v. Block does not require the re-evaluation of Forest lands for recommended wilderness study areas or non-wilderness at the site specific level of decision-making.

The requirement to consider the effects of wilderness versus non-wilderness recommendations is found in the Forest Service Handbook (FSH 1909.12 Chapter 74 (5.)) and is inherently a part of programmatic land allocation planning, i.e. Forest-level planning. See FEIS, Appendix C. This section of the FSH describes the process for documenting the evaluation of wilderness recommendations resulting from either land management planning or from legislatively mandated studies. This consideration was

made during the 2005 revision of the Forest Plan and the results were documented in the FEIS (USDA Forest Service 2005b) consistent with that direction. The FEIS analyzed the effects of various land allocations, including potential wilderness recommendations across the Forest. The effects of each alternative on social, economic, and biological resources and values were studied and disclosed in the FEIS (USDA Forest Service 2005b), and the rationale for the selected alternative captured in the Record of Decision. The FSH requirement to consider the effects of wilderness versus non-wilderness designation was an integral part of the FEIS for the plan revision, which identified "Management Emphasis through Land Allocation" as one of three central issues around which alternatives were developed (USDA Forest Service 2005b).

The Mill Brook project is designed to address site-specific resource conditions in an effort to manage the Forest toward its Desired Condition and is entirely consistent with direction for Management Area 2.1, the MA into which lands within the project area were allocated in the 2005 Forest Plan. The comment presumes that there is a loss of characteristics and values for land that was not allocated in the Plan as recommended for wilderness. This is not the case, as indicated by current favorable resource conditions (e.g. recreation, visual resources, see USDA Forest Service 2005b, pp 3-310, 3-445)), in the light of the long history of active management on the Forest.

Comment: "It is not clear if the Forest Service has met the requirements of Interim Directive 1920-2006-1, which in certain cases requires approval from the Chief before proceeding with projects in IRAs…."

Response: Interim Directive 1920-2006-1 expired in July 2007 and is therefore no longer in effect. The Forest Service is currently complying with regulations promulgated under the 2001 Roadless Area Conservation Rule for those lands identified as part of that rule (commonly referred to as "RACR roadless areas"). Lands not identified under the 2001 rule are managed consistent with the 2005 Forest Plan and other applicable law, regulation, and policy. The portion of the Kilkenny IRA proposed for management as part of Alternative 2 (a total of 292 acres) was not identified during the 2001 RACR process. This portion of the Kilkenny Area was identified as part of an inventory during the Forest Plan revision process. These acres were never part of the lands subject to the limitations of the 2001 Rule. It is important to note also that the inventory process completed during Forest planning was just that: an inventory or list. The Plan revision inventory process did not designate lands as "roadless" but instead formed the basis for recommendations for inclusion of certain lands in the National Wilderness Preservation System. Lands identified by the Plan revision inventory process that were not recommended for Wilderness are managed under the designated management direction of the Plan.

Comment: The commenter believes that the preparation of an environmental impact statement (EIS) is required due to Forest Service Handbook guidance stating that an EIS is required if a proposal would substantially alter the undeveloped character of an inventoried roadless area, continuing on to state that the Mill Brook project would do so by reducing the size of the area that qualifies as roadless. The commenter states that the EA should discuss the process of defining and setting boundaries for inventoried roadless areas that takes place during the roadless inventory process, which would show that "it's not the overall percentages [of road miles and harvest acres] for the area as a whole, but the percentages in subsets of the area…that result in reductions in the overall size of the IRA during the inventory

process." The commenter is concerned that while the core of the IRA may remain intact, the overall acreage may be reduced.

The commenter then disagrees with Forest Service Handbook guidance (FSH 1909.15 Ch. 20.2) that allows project-level analyses to tier to programmatic environmental impact statements in roadless area analyses, stating "It is not correct to argue that the Forest Plan EIS already considered roadless area allocation. Case law is very clear that a forest plan EIS doesn't satisfy NEPA requirements for an EIS on site-specific impacts of roadless area development. See, e.g., City of Tenakee Springs v. Block, 778 F.2d 1402 (9th Cir. 1984)."

Response: Even with an active program of timber harvest and other management activities ongoing throughout the existence of the White Mountain National Forest and specifically since earlier roadless inventories (conducted as part of RARE I and II in the 1970s and as part of development of the 1986 Forest Plan), acres of identified inventoried roadless area have actually increased on this Forest; from 241,000 acres in 2000 to 403,000 acres today. The area in and around the stands to be harvested in the 2005 roadless inventory has been harvested in recent (1990s – 2000) and earlier (1940s – 1980s) periods. Since the previous Forest Plan, a "light on the land" forestry program allowed the White Mountain National Forest to actively harvest timber while simultaneously increasing roadless areas by many thousands of acres, including in this portion of the Kilkenny IRA. Furthermore, acres of actual designated wilderness have also increased, from 114,300 acres in 1990 to 148,800 today (EA, Chapter 3.5, p. 33). This is strong evidence that active management on the Forest is both responsive to environmental concerns and sustainable.

The comment is concerned that the site specific environmental effects on the IRA have not been disclosed. We agree with the comment that the site specific effect of the Mill Brook project were not analyzed or disclosed during Forest Plan revision. Instead, the process for identifying roadless areas is found in the Forest Service Handbook (FSH 1909.12, Chapter 71) was completed as part of Plan revision. The process was not described in exact detail in the site specific analysis in the EA because identification of an inventory of roadless areas is part of programmatic land management planning. As noted previously, this inventory process involves identification of lands, not designation or allocation of management direction. This inventory process is not re-visited during the site specific analysis for projects such as Mill Brook. The comment's contention regarding subsets or subdivisions of the IRAs is incorrect. The areas are evaluated as a whole during the Plan revision process,

We disagree with the comment's assertion that the site specific environmental effects have not been adequately disclosed. The EA analysis of potential environmental effects on the Kilkenny IRA utilizes the same criteria as were used to identify roadless areas during Plan revision to disclose project-level effects to the IRA with regard to their capability for possible future wilderness recommendation. Whereas the Plan-level inventory process was not revisited, the same criteria are examined at both Plan and project level to assess and disclose the potential effect of the proposal. The IDT used these criteria to take a hard look at the affect the project will have on any future wilderness capabilities of the Kilkenny IRA. The methodology, data, analysis, rationale and finding are set forth in the record (EA Section 3.5). The resulting analysis provides a clear, direct, consistent and easily understood method of evaluating potential effects on the wilderness attributes of these lands within the project area.

The Mill Brook project does not propose to authorize any road construction or re-construction in the Kilkenny IRA. In fact, the decommissioning activities proposed would result in a net reduction of road miles in the IRA, from 2.6 miles to 2.3 miles (EA, Appendix B). This results in a change in road density from 0.07 miles per 1000 acres to 0.06 miles per 1000 acres (EA, Chapter 3.5). This represents a minor environmentally beneficial effect. The EA notes that the small area proposed for harvest (292 acres) constitutes 0.7% of the total acreage in the IRA and would bring the total acres harvested within a 10-15 year period to 1.7% – well below the 20% threshold within a 10-year period for lands to meet criteria for inclusion in a future inventory of roadless areas as set forth in the Handbook (FSH 1909.12, Chapter 71). Neither the acreage nor the quality of resources presently found in the Kilkenny IRA would be irreparably harmed as a result of this proposal.

As discussed above and in previous responses, the EA tiered appropriately to the Forest Plan FEIS and Record of Decision, and fully analyzed the proposed activities on lands in the Kilkenny IRA to determine whether significant effects would occur. The analysis concluded that affected lands would continue to meet roadless inventory criteria and no future land use option would be precluded due to project implementation. Consequently, the EA is the appropriate level of site-specific analysis for this project, and is entirely consistent with the Forest-wide analysis and land allocation decisions made in the Record of Decision and FEIS for the Forest Plan.

Comment: The commenter is concerned that the number of vegetation management projects currently under consideration in IRAs across the White Mountain National Forest will reduce the future inventory acres when new boundaries are assessed, and so all projects should be considered when assessing cumulative effects to roadless areas, roadless character and potential future Wilderness.

Response: The rationale behind the selection of the geographic and temporal boundaries for the cumulative effects analysis area is set forth in the EA (Section 3.5). The scope of the Mill Brook project is such that the direct, indirect, and cumulative effects do not extend into any other IRA on this or any other National Forest. Furthermore, because the project is based on site-specific purpose and needs and does not follow or establish precedent to take similar action in any other IRA on the Forest, the selection of the Kilkenny IRA for cumulative effects analysis area is an appropriate spatial area of consideration. Stated differently, the proposal has independent utility or purpose apart from other actions that may be proposed on the Forest. As noted in the EA (section 1.1), the Mill Brook HMU has a present need for vegetation management to improve forest health and wildlife habitat within this HMU. Regardless of other actions that may occur on the Forest, this action is designed to respond to the site specific need. The purpose and need for this local action is supported by field observation of existing conditions within the HMU, as set forth in the EA.

The evaluation of timber harvest activity on inventoried roadless areas across the entire Forest land base is a programmatic/land allocation analysis. Consideration whether to allocate lands that meet baseline roadless inventory criteria into Management Areas that allow timber harvest following a roadless inventory and subsequent wilderness evaluation is, at its essence, such an evaluation. This Forest underwent this effort in 2005 with the revision of our Forest Plan, and the effects of these allocations are fully described in the FEIS (USDA Forest Service 2005b). The comment seeks to re-open the Forest-wide programmatic analysis and inventory process for roadless areas. The planning process produced a roadless area inventory or list, which is not the same as a

designated management area prescription. The planning process involved an extraordinary degree of public participation. This comment is based upon the presumption or view that the inventory itself has a meaning apart from the allocation decisions made in the Plan. However, the inventory process has long been completed, and the lands allocated to various management prescriptions as set forth in the Plan. There is no reason to re-open the programmatic decision-making process at this time. It is important to note that our revised Forest Plan provides a balance of public interests and uses supported by numerous organizations representing local and regional governments, timber interests, and environmental groups. The Forest Plan was not administratively appealed by any group or individual – one of the few times in 25 years across 155 national forests that a Forest Plan as not been appealed.

This White Mountain National Forest has balanced ongoing, responsible vegetation management with other uses and values such that today more that 160,000 additional acres of land were determined to meet baseline roadless inventory criteria than in 1986. This represents a 67% increase, from 241,000 to 403,000 acres during a period of active management on the Forest, including projects similar to the Mill Brook proposal.

Regarding other projects in IRAs on the White Mountain National Forest, on June 6, 2008, the United States District Court for New Hampshire ruled in favor of the U.S. Forest Service in the case of Sierra Club v. Wagner which challenged the Than and Bachelder Brook management projects, both in part due to proposed activities in IRAs with allegations regarding the need to do EISs. The court disagreed, ruling that the Forest Service appropriately analyzed the proposed activities, including the analysis of effects to IRAs.

Comment: The commenter supports the selection of Alternative 3 in order to protect the Kilkenny IRA, stating that the timber volume doesn't justify the impacts to the IRA, because mills have closed there is no need for the wood. Also, a precedent is being set with this and other White Mountain National Forest timber harvests in IRAs, and the current legal action against the White Mountain National is based partially on the Forest Service's insistence on road building and harvesting timber in IRAs.

Response: Acres of land meeting baseline roadless criteria have actually increased rather than decreased on National Forest System lands in New Hampshire and Maine (EA, 3.5; USDA, 2005b) during a time when the Forest has seen much active management similar to that proposed by the Mill Brook Project. The EA clearly discloses effects to pertinent characteristics of the land and demonstrates that lands within the project area that currently meet roadless inventory criteria would continue to meet those criteria following project implementation. This was a key issue and a focal point for the analysis. The trade-offs and consequences of vegetation management in the IRA portion of the project and no action at this time are clearly set forth in the record. The IDT was very aware of the public concern as well as the public support for taking action to improve forest health, wildlife habitat, and plant and animal community diversity within the Mill Brook HMU. In the design of this proposal, we listened to the public and taken local field conditions into account to develop an action that will not irreparably harm the resource conditions within the IRA.

As described in the EA, Chapters 1.1 and 3.5, the Forest Service proposes to take action in this HMU at this time due to site-specific resource conditions (based largely upon field work during project development) and guided by Management Area direction

and standards and guidelines in the Forest Plan. The proposal here responds to a site specific purpose and need based upon existing resource condition in the HMU. The purpose for this action is not dependent upon whether lands do or do not meet criteria for inclusion in an inventory of roadless areas. As stated previously, this project has independent utility in that it addresses identified resource concerns within a particular portion of the Forest (i.e. the Mill Brook HMU). There is no relationship between the purpose and need for this project and other ongoing or proposed actions. The purpose for taking action in this location at this time is not contingent upon other actions, either past or future. In short, project does not follow upon any other action, nor does it set a precedent to take action elsewhere. Action in the Mill Brook HMU is not dependent upon any past projects, nor determinative of where, when, why other projects may be proposed in the future.

See Section 17 (General Comments), Appendix B of the EA for a discussion on forest product markets in the White Mountain National Forest area. In reality, every White Mountain National Forest timber sale in the past several years has received bids, indicating an ongoing need for forest products. Timber harvests have occurred in the Kilkenny region for several decades, including 405 acres in the Kilkenny IRA since 1998. The predicted environmental effects of the Mill Brook project proposals have been thoroughly disclosed in Chapter 3 of the EA and considered in the selection of Alternative 2.

Please see the above response regarding *Sierra Club v. Wagner* lawsuit. As noted previously, the purpose and need for the Mill Brook proposal is resource-driven, based upon local specialists' review of on-the-ground conditions. The comment suggests that the location of the Kilkenny IRA was determinative of when and where action would be taken. That view of the purpose and need for the action is incorrect. Instead, forest health, wildlife habitat, and plant and animal diversity concerns within the project area are the primary reasons for undertaking this action at this time.

Comment: "Numerous scientists, including one hired by your agency to assess the biodiversity of the White Mountain National Forest, have urged the protection of all remaining roadless areas on the forest, as private lands surrounding it are heavily logged, roaded, and increasingly subject to development and rural sprawl."

Response: We believe the commenter is referring to the Assessment of Terrestrial Biodiversity in the White Mountain National Forest Region (Cline et al.1999) we contracted and reviewed during the revision of our Forest Plan. Please see the response in the Wildlife section regarding that assessment.

With regard to diversity, NFMA, 16 U.S.C. Section 1604(g)(3)(B) states: "provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives …."

Thus, NFMA requires that diversity be viewed in the multiple use context, taking into consideration local resource conditions. The multiple use objectives for the Mill Brook area are set forth in the Forest Plan (Management Area 2.1), which allows for vegetation management to produce wood products and ensure the resiliency of the remaining natural resources.

The programmatic FEIS for the Forest Plan is in part based on scientific evaluation of the biological resources of the Forest and the surrounding region. Under the management allocation of the Forest Plan, 53% of the land base will not have timber harvest or road building activities. The remaining 47% may allow timber harvest for site-specific

resource purposes such as creation of wildlife habitat. This mix of activities and conditions was carefully evaluated through the Forest Plan revision process, and the effects disclosed in the FEIS. Project analyses such as the EA for the Mill Brook project additionally consider effects to biological resources in the site-specific context of the local area, and tier to the programmatic FEIS for additional regional context. The opportunity to improve diversity in wildlife habitat types and age classes within this portion of the HMU was a key consideration in project development (see EA section 1.1, wildlife habitat). The interdisciplinary team examined the extent of logging on private lands within and adjacent to the project area, and considered those effects to wildlife habitat and vegetation in the project area (see EA Sections 3.11, 3.15, and 3.16).

Comment: "The Kilkenny is a particularly remote area of the national forest, offering superb opportunities for solitude and the experience of wildness. Such opportunities are increasingly rare in the Northeast. Logging within the roadless area will diminish these qualities."

Response: We agree that the Kilkenny region has an abundance of opportunities for the experiences of remoteness and solitude (USDA Forest Service 2005b, p. C-97). As demonstrated in the EA (Section 3.5) effects to opportunities often unique to wilderness would be temporary in nature and would not affect these opportunities across the area as a whole. Map 5 of the EA provides a perspective of the project area as it relates to the larger Kilkenny region. Whereas the comment focuses on the social effects examined in the EA with regard to wilderness, the project must be viewed as whole. The physical resource conditions within the project area (e.g. need to diversify wildlife habitat types, removal of dead and dying trees as a result of the 1998 ice storm) must be balanced with social considerations, e.g. the demand for solitude and wilderness experience. The Mill Brook project responds to existing field conditions in a way that is sensitive to the public's desire that the characteristics of the Kilkenny IRA be protected. In a multiple use context, plant and animal diversity, forest health, and recreation opportunities must all be considered. This balance is demonstrated in the Mill Brook project. The EA describes the short-term effects upon resources, including recreation, in order to achieve the longer term benefits of a healthier, more resilient forest. Field work, surveys, and the re-growth following similar past projects implemented in this same area support the determination that the project will not significantly affect the Kilkenny IRA. The potential for future recommendation of the Kilkenny IRA as wilderness will be protected.

5. Socio-economic Assessment

Comment: "The EA does not describe any costs that are likely to be absorbed by the County and the Town of Stark, such as road and highway maintenance. Are road maintenance activities carried out and paid for by the county or the local town government? What are the estimated costs the towns and / or county would have to absorb?"

Response: There are no town or county roads associated with the Mill Brook Project, and so no road maintenance activities will be carried out or paid for by the County or Town government. There are no other predicted costs to the towns or Coos County as a result of the Mill Brook Project; however the Town of Stark will receive revenue as a result of the Mill Brook Project. See Table 5 in Section 3.9 of the EA.

Comment: The commenter notes that we describe the NH Timber Yield Tax as averaging "about 10% of the value harvested," and would like to know the actual percentage over the last 5 years.

Response: The wording in the EA has been corrected to reflect the exact wording of the New Hampshire Statute [Chapter 79 (Forest Conservation and Taxation), RSA, Section 79:3, Normal Yield Tax]. Section 79.3 describes the tax as "[a] normal yield tax at the rate of 10 percent on the stumpage value at the time of cutting" and not an average. The Towns assess and collect the 10% yield tax from timber purchasers harvesting on private and public lands each year.

Comment: "Table 5 is a bit misleading. The Twenty-Five Percent Fund provides money to the state for disbursement to the towns, and not just the town where harvest takes place. The town of Stark is likely to receive far less than "25% of gross timber receipts." We realize the table does say "to NH", but since local effects of the proposed project are likely of higher interest it would be helpful to understand the percentage of Twenty-Five Percent Funds that eventually reach the town, especially since it is the entity most likely to be faced with indirect costs from the project in the form of an accelerated need for road maintenance. Please disclose the funding formula used by the state of NH and Coos County to disburse Twenty-Five Percent Funds. What would the Twenty-Five Percent Fund payments to the town of Stark then be?"

Response: To clarify: the stumpage receipts in Table 5 are noted to be based on net figures, not "gross stumpage receipts."

As the commenter recognizes, we displayed the predicted 25% Fund payment to the State, rather than to the Town of Stark. This is because the payment from the Forest Service goes directly to the State which then disburses funds to counties and towns.* The payment from the Forest Service to the State is comprised of revenue produced from a variety of activities across the national forest in any given year, not just timber harvest. The disbursements from the State to the Towns and Counties cannot be attributed to one activity or one timber harvest project such as the Mill Brook Project; therefore we cannot determine the payment to the town of Stark.

The State of New Hampshire designates the funds only for the purpose of schools (RSA 219). The funds cannot be used for road work. (Note: As stated above, there will be no road costs to Stark as a result of the Mill Brook Project.)

*The total 25% Fund payment to the State is divided by the total national forest acreage in the state, providing a per-acre dollar amount. Towns (or counties for areas with no town governments) then receive a disbursement based on the national forest acreage in the town.

Comment: The commenter states that the 25% payment will be lowered by Knutson-Vandenberg (KV) and stewardship funds withheld and requests "a copy of the completed KV plan (with associated costs) when it is done and a copy of the Stewardship Contracting plan should that funding mechanism be pursued."

Response: The 25% Payment is not affected by Knutson-Vandenberg (KV) funds collected after timber harvests. Stewardship Contracting, if used, would retain receipts for on-the-ground restoration work in the project area, and therefore would not contribute to the 25% payment to the State of New Hampshire.

Requested plans for the Mill Brook project will be provided when developed.

Comment: The commenter asks which sales were used in calculating potential stumpage values and costs, and requests for each sale: minimum bid price, actual winning bid price, estimated Forest Service costs, actual Forest Service costs, estimated 25% Fund revenues, estimated NH Tax revenues, actual 25% Fund revenues, including the counties that received the funds and the towns within the county that received the funds and fund amounts by town, actual NH Tax Revenues, including the towns that received the tax return funds and tax return amounts by town. The commenter requires this information to provide the "needed context for assessing the costs and benefits of the Mill Brook Project."

Response: The economic analysis for the Mill Brook project is discussed in Section 3.9 of the EA. The analysis gave the Responsible Official the meaningful information required to understand the social and economic effects of the Mill Brook Project in order to make a reasoned decision when choosing a course of action.

The financial implications for the Towns of Stark and Milan (identified as the cumulative effects area for the socio-economic assessment) are discussed in Section 3.9 of the EA. The analysis incorporates the relevant economic figures identified by the commenter above: bid prices (used to calculate the estimated stumpage values), Forest Service costs, and revenues from the 25% Payments-to-States fund and the NH Timber Yield tax.

Information regarding the economic impacts of the White Mountain National Forest's activities may be found in the FEIS for the 2005 Forest Plan (pp. 3-391 through 3-519). This site specific analysis is tiered to the FEIS, as appropriate. See 40 CFR 1508.28.

Actual data from the most recent sales of similar geography and forest types were used to estimate revenue expected from the Mill Brook Project. The sales used are: **North Carter, Mount Mitten, Lower Loop, Upper Ammonoosuc, and Pond Brook.**

With regard to the commenter's specific requests:

- Minimum and awarded bid prices for all White Mountain National Forest timber sales since 1986 were supplied to the commenter's organization in early 2007. Additional information sent to the commenter includes estimated 25% Fund and estimated NH Tax revenues for the five sales, as well as bid awards for the recent nearby Pond Brook and Upper Ammonoosuc timber sales.
- All five sales are still active so actual 25% Fund and NH Yield Tax payments can not be determined at this time.
- Estimated Forest Service costs are used as economic indicators in environmental analyses (see Table 5 in the Final EA). The costs are based on total estimated volume for an entire project area, which, after a formal Decision is often then split into more than one timber sale. Estimated and actual costs are not tracked by individual timber sale.

Comment: The commenter is concerned with the accuracy of the Spectrum modeling results and the data presented in the FEAST for the Forest Plan analysis that showed a lack of cost-efficient harvest across the forest for the foreseeable future.

Response: The comment concerns the economic analysis completed as part of Forest plan revision. Spectrum modeling results and the data presented in the FEAST for the Forest Plan analysis involve the entire 796,800-acre Forest are beyond the scope of the site specific analysis for the Mill Brook Project. The Mill Brook economic analysis discloses estimated costs and revenues based on historical data and legal requirements,

and are intended to provide the District Ranger with the information needed to make a reasoned decision about this site specific action. The Forest is aware of the need to make improvements with regard to cost-efficiency. To the extent the comment seeks to reopen the completed programmatic analysis for the Plan, there is no evidence of a need to revisit that analysis. This issue was not raised during the administrative appeal opportunity on the decision on the programmatic Forest Plan (no appeals of that decision were filed).

Comment: "We are also concerned that the calculation of net stumpage receipts does not reflect the effect that the high cost of diesel fuel and the collapsing housing construction market will have on stumpage prices."

Response: The estimated net stumpage receipts displayed in the EA, Table 5, are based on contract awards for recent timber sales, including two sales in the last year (Pond Brook and Upper Ammonoosuc). Those prices do account for operating costs and market conditions. We used the most current available information when calculating estimated stumpage receipts for the Mill Brook Project. Stumpage prices are somewhat higher now than they were when the Pond Brook and Upper Ammonoosuc sales were sold, and the upward trend could continue and be reflected in stumpage values when Mill Brook is sold. When the timber is cruised and appraised in the sale preparation phase of the project, operating costs and markets will be factored into the stumpage calculations when developing a minimum bid price.

Comment: The commenter states that the high number of visitors to the White Mountain National Forest contributes to tourism, which is a significant component of New Hampshire's economy. The commenter believes that protection of roadless areas is an important economic, as well as ecological, function of the national forest because visitors come seeking natural scenery, backcountry recreation, abundant wildlife, and the peace and serenity of the forest.

Response: We agree and take pride in the fact that the White Mountain National Forest is highly visited and beloved by many people for many reasons. We know both anecdotally and from the social and economic analyses conducted while developing our Forest Plan that our visitors treasure the very resources and opportunities the commenter mentions. The history of the White Mountain National Forest includes decades of timber harvest and other management activities that have contributed to the diversity of forest types while protecting native species, water quality, scenery, and other resources which are valued by visitors and residents alike. As described in the analyses and effects disclosed in Chapter 3 of the EA, we have designed the project to protect or enhance the "natural scenery, backcountry recreation, abundant wildlife, and the peace and serenity of the forest." The analyses and conclusions regarding direct, indirect, and cumulative effects of the Mill Brook Project are in the EA in Section 3.8 (Scenic Resources), Section 3.7 (Recreation), Section 3.15 and 3.16 (Wildlife and Federal Threatened, Endangered, and Proposed Species), and Section 3.5 (Inventoried Roadless Areas).

We also note that tourism is an important aspect of New Hampshire's economy, and that outdoor recreation in the White Mountain National Forest is a component of the overall tourism in the Forest region. However, the Mill Brook area receives relatively low visitation and the re-growth of vegetation in this area will allow this area to return to a natural appearance in a very short timeframe. Equally important, the short duration of the harvest activities means that the project will have minimal and short-term

effects on outdoor recreation, and there will be no measurable economic effects to tourism. This site specific analysis is tiered to the broader programmatic analysis of the socio-economic context of the Forest and potential effects upon recreation and tourism generally.

6. Soils

Comment: The commenter is concerned that the project will affect high quality soils by reconstructing roads and skidding logs, compacting soils and removing biomass that would eventually enrich the soil, and that soil movement from road reconstruction and skidding in turn will adversely affect high quality waters, which have been recognized by the Forest Service by the designation of the Mill Brook as eligible for Wild and Scenic River status.

Comment: The commenter observed conditions in an active timber operation elsewhere on the Forest including "many residual trees along skid trails having bark damage, ruts within the Units, trees being skidded on bare ground, silt fences falling over and deep ruts along the skid trails," and asks how we can ensure that application of Forest Plan Standards and Guidelines as well as BMPs will prevent soil erosion and other problems, and ensure that comparable damage doesn't happen at Mill Brook.

Response: Forest Plan standards and Guidelines, required Best Management Practices outlined by the State of New Hampshire, and the proposed design features for this project this will be applied to protect soils. During active harvest operations, Forest Service personnel familiar with the mandatory mitigation for this action will inspect project implementation to ensure that these protective measures are properly executed. If problems are encountered in the field, remedial measures are implemented. Project monitoring by a qualified timber sale administrator to ensure soil and water protection is a key part of project design.

In addition, the timber sale contract requires all ground-disturbing activity be followed by "closure" work once operations have ceased. Closure work includes the application of erosion control measures that stabilize soils, direct surface water, and promote revegetation. Past project closure activities have shown that these site stabilization measures are effective and re-growth soon returns the area to natural appearance. Short term effects soon fade, while the longer term forest health and wildlife habitat benefits remain.

The rationale for the effectiveness of the soil and water standards and guidelines is documented in the project file (Colter 2007). The project is consistent with the applicable soil and water standards and guidelines. The conclusions reached in the soils analysis (Section 3.10) with regard to the nature and extent of the potential soil effects are based on a thorough site specific analysis that considers the best available science regarding minimizing erosion and compaction, as well as protection of soil productivity. The effects analysis is founded upon knowledge gained from monitoring prior timber projects, including field survey (stocking surveys) of similar sites which showed successful regeneration of trees in the first 3-5 years after harvest. Bark damage in the residual stand is kept to a minimum by proper placement of skid trails and close interaction between the Forest Service timber sale administrator and the operators.

Comment: A commenter states that neither the soils discussion in the EA or the project's Soils Report specifically mention which stands were visited by the Forest

Service soils scientist, and asks if "all Units visited and shovel tests done in all Units?"

Response: Although there is no law or policy requirement to do so, the Forest Soil Scientist visited and conducted a field evaluation of all stands proposed for harvest as part of the Mill Brook project. The record demonstrates that the soils effects analysis is grounded in field work and professional expertise concerning local resource conditions. In addition, information gained from past management and protective design features are taken into consideration in project design. The field evaluation methodology utilized, as well as the rationale for its selection, is set forth in the record. The methodology employed here by the expert soil scientist is reliable and consistent with the recommendations of the best available published scientific information. In addition, information regarding the ecological land types, photographs of the field and field observations and notes are included in the project file. The record also documents the analysis of the field information and the conclusions drawn from it with regard to potential effects. Based on the application of protective measures such as standards and guidelines, Best Management Practices, and project design features, field work and other information, the soil scientist concluded that the project would not result in any irreversible damage to the soil resource nor have a significant effect on soils in the project area.

7. Transportation System

Comment: "There seems to be some confusion as to the number of miles of unauthorized roads to be classified as authorized system roads in the Mill Brook Project area. Table 2 (Preliminary EA, pg 15) lists 6.9 miles of unauthorized road to be classified as Forest Roads. These are essentially new roads as they are not now and have not been a part of the system roads on the Forest. If this number is accurate there is clearly a net gain in miles of system roads. The figure of 6.9 miles is contradicted by language elsewhere in the EA stating that there will be a net loss of Forest Roads through the decommissioning of 2.4 miles. Please clarify."

Response: To clarify, 3.8 miles of existing **Forest Roads** will be re-designated in the database to properly reflect what is on the ground and/or to assign the proper Maintenance Level to these roads. The Final EA (Table 2) has been corrected to clarify that there are only 3.1 miles of **unauthorized roads** that are proposed for classification to Forest Roads. Unauthorized roads are defined in the Glossary (Appendix D) as "those which exist on the ground but are not currently Forest Roads. Previously referred to as unclassified roads." Unauthorized roads are recorded in White Mountain National Forest Service travel databases. They are not new because they do exist on the ground and have been used in the past for the very need that exists today – to haul timber. Road #2203 (see map inset) among others, is an example of this situation: the road was used in 1976 as part of the Mill Brook Thinning Timber Sale and again in 1996 as part of the Mill Mountain Timber Sale. In the late 1990s (at which time this road gained the 2203 identifier) the Forest Service began the first of several attempts to develop data on location and types of roads on National Forests across the country. Although it is nearly ten years since this process began, road #2203 has never been fully analyzed until the roads analysis conducted for this project, which recommends classification of 0.1 miles as a Forest

Road #2203 located in Stand 2-45. See also Map 2 in Appendix A

Road and decommissioning 0.4 miles. White Mountain National Forest travel databases will reflect a move in classification from "unauthorized" to "Forest Road."

Table 2 of the EA lists project proposals including classifying 3.1 miles and decommissioning 2.4 miles of roads as recommended in the roads analysis. The 2.4 miles does not represent a "net" loss of Forest Roads as indicated on page 140 of the Preliminary EA, and the wording is now corrected. Thank you for bringing this to our attention.

Comment: The commenter is concerned about the "excessive number of road miles on the White Mountain NF" and the small amount of proposed decommissioning, and would like a more "aggressive approach given budgetary limits and the potential adverse effects of roads."

Comment: The commenter would like to keep as many roads "and then some" open into the future. Decommissioning is too permanent and we may need those roads in the future.

Response: These two comments mark the range of opinions regarding the road classification decisions in the Mill Brook Project. We conduct project-level roads analyses in conjunction with environmental analyses to determine the road system needed for long-term management. Part of that process includes deciding the final classification of the remaining miles of unclassified roads on the Forest (Appendix D, FEIS – USDA Forest Service 2005b p. D-12). The Forest Service recognizes the maintenance burden presented by existing roads and is working at the project level to refine the road system to retain the minimum miles of roads into the future. On the other hand, we must also efficiently retain access for land management and public needs. The connected actions section located in Chapter 2 of the EA and Maps 2 and 3 identify the minimum road system needed in the Mill Brook project area as as identified in the project Roads Analysis. Analysis of roads outside of the project area is beyond the scope of the project.

Road maintenance to protect resources will be conducted as the Mill Brook project is implemented. In addition, the Forest conducts annual road maintenance to ensure safety and resource protection.

Comment: The commenter feels the Forest Service failed to identify the long-term needs and the minimum road system needed, as required by 36 CFR 212.5(b), which states "the minimum system is the road system determined to be needed to meet resource and other management objectives adopted in the relevant land and resource management plan, to meet applicable statutory and regulatory requirements, to reflect long-term funding expectations, to ensure that the identified system minimizes adverse environmental impacts associated with road construction, reconstruction, decommissioning, and maintenance."

Response: From 36 CFR 212.5(b): "In determining the minimum road system, the responsible official must incorporate a science-based roads analysis at the appropriate scale…" The Mill Brook roads analysis identified the minimum road system needed to meet resource and other management objectives for the project area, as directed by the Forest Plan (Appendix D, FEIS – USDA Forest Service 2005b p. D-12). Compliance with statutory and regulatory requirements is ensured through the use of and adherence to the Goals, Objectives, Standards and Guidelines as listed in the Forest Plan (USDA Forest Service, pp. 1-16 to 1-17, and 2-27 to 2-28).

Funding for road maintenance activities comes from varied sources and has traditionally been difficult to predict. This does not mean that needed actions on the ground have gone un-fulfilled. Road activities needed as part of timber sales are funded and undertaken as the sales occur. Funding for needed road maintenance activities that are not connected to timber harvest activities (the planned maintenance of FR 11E is an example; see Section 1.1) can come from Knutson-Vandenberg (KV) or other sources as appropriate. The environmental impacts associated with various road maintenance activities are discussed as part of the effects analysis for each resource in Chapter 3 of the EA.

Comment: The commenter states that the reclassification of roads from "unauthorized" to "Forest Road" should be considered new construction, and as such they should undergo a NEPA analysis to determine the impacts of the roads, and whether they are needed as Forest Roads.

Response: All roads in the project area were examined and proposals made for classification changes as needed. The full roads analysis is in the project file and the need for change is summarized in Section 1.1 of the EA.

Reclassifying roads as proposed in the Mill Brook Project amounts to administrative adjustments in our database. All roads exist on the ground, and where currently "unauthorized" roads have been deemed necessary for long-term management of the area, the database status will be changed to "Forest Road." Construction and reconstruction are engineering terms related to ground-altering activities using construction equipment. The changing of a status code in a database to reclassify a road from "unauthorized" to "Forest Road" would not result in any ground disturbance or other change in the condition of the road on the ground. Therefore reclassification is not new construction or reconstruction. The environemental effects of using and maintaining roads are analyzed on a project-level basis when they are proposed for use or otherwise require work to protect resources.

Comment: The commenter wants to know "what process is the Forest trying to circumvent" because of the statement in the EA regarding the plan to use this current analysis to add segments of private roads to the Forest database because "if the Forest Service were ever to pursue a permit to use these roads or negotiate a purchase of the private inholding in question (…), the roads would not have to go through the lengthy process of be(ing) added to the database as new roads."

Response: These roads were evaluated at this time because they are in the Mill Brook project area and we conducted a roads analysis that included all roads in the project area.

It is likely they will be needed in the future: Road 2205.1 is an existing road that was last used in the 1980s to access timber in that portion of the Mill Brook area and was properly closed out post-harvest. A landing exists at the end of this road, and would most likely serve in that capacity when timber is next harvested in the area. Both even- and uneven-aged treatments have been carried out here in the past and will provide a source of forest products in the future. Road 2204 is an existing road that currently provides access for several camps located on a private inholding and will be needed for access in the future.

The "lengthy process" referred to is nothing more than the steps we have conducted for the Mill Brook Roads Analysis -- field examinations, data collection, soliciting and addressing public comments, researching history of use, and considering future

needs in order to make informed decisions regarding classification. Deferring this roads analysis analysis until later is not efficient; it just makes sense to address these private road segments at this time when we can easily incorporate the analysis into our current efforts.

Comment: The plan to decommission what are currently known as "unauthorized roads" leaves the commenter questioning "how can you decommission something that technically (in an officially recognized sense) doesn't exist?" The commenter also wonders if engineering road funds can be used for work on unauthorized roads, and notes the opinion that "decommissioning unauthorized roads does nothing to reduce the miles of system road and does nothing to reduce the maintenance backlog, because these roads were never counted in the maintenance total to begin with."

Response: Unauthorized roads are "officially recognized" and recorded in White Mountain National Forest Service travel databases. Engineering road funds are reserved for Forest Roads (formerly classified roads) only. As unauthorized roads are decommissioned and closed out as part of timber sale activities, fewer miles will be part of the road system, and fewer roads will be available for classification. Maintenance backlog will be reduced.

Comment: The commenter believes that FR 11 should end at the northern boundary of the large parcel of [private] land north of the Unknown Pond trailhead, and FR 11 south of that point as well as Road 2205.1, 2205.2, and 2204 should be decommissioned and rehabilitated to natural contours. The commenter believes these roads are steep, not needed, go nowhere, and "intrude upon the boundaries of 2001 Roadless Area Conservation Area (Kilkenny IRA)."

Comment: The commenter notes that due to maintenance backlogs, the Forest Service should question the need for many of the roads in the Forest System, and that the classification of Forest Roads in the Mill Brook area is "ludicrous," proposing that FR 199, 200, 11A and 11E be decommissioned.

Response: Considering current and future management needs as well as public access, resource specialists evaluated the need for each road in the project area and decided to decommission about 2.4 miles of roads. Forest Road 11 has roughly paralleled Mill Brook for several decades, with its present location and form since the early 1980s. It provides needed access to the Unknown Pond Trail and for maintenance of the wildlife opening at the end. The Forest Service recognizes the maintenance responsibility presented by existing roads and is working with each project analysis to refine the road system to retain the minimum miles of roads into the future. See section 1.5, Alternatives Considered but not Analyzed in Detail, of the EA which discusses a similar suggestion to decommission roads. Also see section 11, Transportation, Appendix B, Scoping comments and responses, for responses to similar comments.

8. Vegetation

Comment: The commenter states that "logging does not promote the health and vigor of residual trees at all - that is a bold faced lie."

Response: We apply proven silvicultural practices to accomplish beneficial effects on the remaining stand of trees. See the analysis in Section 3.11 of the EA for a discussion of the effects of various harvest methods and literature on which that analysis was based. The analysis takes into account decades of research regarding the effects

of various harvest methods on residual vegetation. Each stand in the project area has been carefully and individually examined by professional foresters to determine existing conditions and the potential vegetation effects of particular silvicultural methods. Thus, the choice of silvicultural action here is based upon professional expertise and on-the-ground field evaluation of the timber stands. The methodology, field notes and observation, and conclusions of the stand examinations are fully documented in the record.

Both the Multiple-Use Sustained-Yield Act ("MUSYA," 16 U.S.C. Section 528) and NFMA (16 U.S.C. Section 1604(g)(3)(E)), contemplate that timber harvest will be conducted on the National Forests. These laws authorize sustainable, multiple use activities on the Forests, including vegetation management. No law, regulation, or policy requires the Forest to preserve all areas in any particular natural condition. Congress provided the discretion to the agency and local land managers to determine the appropriate use of particular areas of the Forest. Consistent with NFMA, MUSYA and other applicable laws, the White Mountain National Forest developed a programmatic Plan which provided for sustainable multiple use management, envisioning forestry as a tool to be judiciously used to obtain the desired future condition set forth in the Plan. The management area direction at issue here, MA 2.1 – General Forest Management, sets forth goals, objectives, a desired condition and other direction which allows for (but does not authorize) vegetation management. An extraordinary amount of public participation was invested in the development of the programmatic Plan, including review of the specific direction included in the MA 2.1 prescription.

With the programmatic framework of MA 2.1 in mind, the Mill Brook project was designed to move the acres in the project area towards the desired future condition in a manner consistent with the direction found in the newly revised Plan. As noted in the Plan, vegetation management on the Forests often polarizes public opinion. The IDT listened to the public's views both opposing and supporting management of the Mill Brook project area, and developed a project which improves forest health, wildlife habitat, and protects other resource values. The IDT is confident based on field work, the best available science, and their study of the results of past actions that the proposal will meet the purpose and need, i.e. improve forest health and the resilience of the residual vegetation.

The comment suggests that logging, including the harvesting proposed here, will not promote the health and vigor of the residual stand, but provides no evidence to support this view.

Comment: "It is important for forest visitors to understand the role of forest management in the maintenance of wildlife habitats, production of renewable resources, and storage of carbon. Signs should be placed on road and trail locations where forest visitors will view management activities. This would help explain the values provided by the work. Also, that this is a shared resource, managed in the best traditions of multiple use."

Response: District personnel have echoed this same idea and we anticipate placing signage at the Unknown Pond trailhead kiosk explaining project activities.

Comment: The commenter requests the development of a new alternative that would be comparable to Alternative 2 in terms of board feet, unit costs, and net value but does not harvest timber in the Kilkenny IRA., stating "As the EA notes, the Mill Brook HMU consists of 17,000 acres, with 9,000 acres in MA 2.1. Preliminary EA at 2.

The proposed alternative will take place on only 1,034 acres, and as such there is no reason to invade the IRA. An alternative that provides similar benefits and opportunities to the proposed alternative, on lands outside the IRA, should be created."

Response: See Section 1.5 Alternatives Considered but Not Analyzed in Detail. All of the forest stands on MA 2.1 lands in the Mill Brook HMU, whether in the IRA or not, were examined in the early phases of the Mill Brook project development. Most stands with appropriate conditions for harvest (based on age, stocking, and/or tree quality) were identified and presented as part of the Mill Brook project proposal in 2006 and/or 2007. Those stands that have appropriate conditions for harvest but were not proposed for harvest have either access, topography, or other resource concerns and are deferred at this time. As the commenter notes, there are many acres in the HMU outside of the Kilkenny IRA, but very few acres are supporting stands ready for harvest at this time. The Forest did, in one sense, consider the alternative suggested here by evaluating all MA 2.1 forest stands in the Mill Brook HMU. However, an alternative comparable in scope (acreage and timber volume) to Alternative 2 located entirely outside the IRA as suggested in this comment is not physically possible at this time for the reasons noted above. Chiefly, there simply are not enough accessible acres supporting stands ready for harvest in the HMU outside of the IRA. Thus, the alternative suggested here is an impossibility in the foreseeable future. The IDT did, of course, consider an alternative with a smaller scope completely outside of the IRA (i.e. Alternative 3), as well as taking no action at all in this HMU.

Comment: The commenter notes that law and regulations require the Forest Service to protect soils, watersheds, streams, fish, and wildlife and to insure that even-aged harvests are determined to be the optimum (for clearcutting) or appropriate (for other harvests) to meet the Forest Plan's objectives and requirements. The commenter expects to see an optimality analysis in the final EA.

Response: Choosing the optimum harvest method for regenerating a particular stand is influenced by the silvicultural requirements of the species on the site, existing stand conditions, issues raised during the analysis, prior experiences in the area, and direction from the Forest Plan. The methodology for determining optimality follows. First, a silvicultural treatment is assigned to each stand after a field examination by professional foresters. These professionals are knowledgeable of field conditions, local resources, and the response of various types of timber stands to silvicultural treatments. This initial stand prescription is based primarily on the biological requirements of the stand in the context of the objectives of Management Area (MA) 2.1 lands as set forth in the Forest Plan (pp 3-3 et seq.). Thus, the programmatic analysis set forth in the FEIS for the Plan guides this process. This stand prescription is then subject to interdisciplinary analysis, and may be modified after special consideration is given to wildlife habitat needs as guided by the HMU objectives for the area. The IDT also considers the issues raised by the public during scoping, other site specific resource considerations, and the alternatives developed. In some cases, stand prescriptions may be modified in order to address site specific resource concerns such as visual quality or water quality. Regardless of the alternative types of actions proposed in the analysis, the proposed harvest method for each stand is always sufficient to ensure adequate regeneration stocking of the stand. Lastly, the Responsible Official independently reviews the work of the IDT and must accept or reject their recommendations with regard to harvest method (including the analysis of optimality). The proposed harvest methods are, of course, subject to public review during the comment period on the EA.

The methodology described above was utilized in the development of the Mill Brook project. After this process was completed, it was proposed that clearcutting would be used in four of the 21 stands in the project area. Two of these, Stands 2-29a and 3-13a, will be patchcut (small clearcuts) in order to permanently convert those areas to open shrubby and grassy habitat for wildlife use into the future. Those two conversions equal a total of nine acres. The remaining two stands to be clearcut, Stands 2-34b and 2-35a, are to be regenerated to the northern hardwood forest type – i.e., new stands of trees will grow on those sites. These two stands equal a total of 47 acres. It is important to understand of the context of this proposal. Altogether, these four stands compromise approximately 5% of the total area proposed for harvest. Only 1 stand proposed for clearcutting (Stand 3-13a, five acres or less than 1 percent of the area proposed for harvest) is within the Kilkenny IRA. These five acres of proposed clearcutting represents 0.01 percent of the Kilkenny IRA. The silvicultural methodology, rationale for that methodology, data, and analysis, and findings with regard to these four stands are well documented in the record.

Based on the analysis, the Forest identified clearcutting as the optimum method for promoting forest health, improving wildlife habitat, and encouraging successful regeneration of certain species in four stands within the project area. The optimality finding is based upon field review of resource conditions for each stand individually, as well as application of the best available science with regard to silvicultural techniques and methods to regenerate northern forest tree species. Information learned from past actions, as well as professional expertise of the foresters, was used in the process outlined above. This work is well documented in the project file. There is no information before the agency that we are aware of that contradicts the detailed field work, resource data, site specific analysis, or expert determination of clearcutting as the optimum harvest method for Stands 2-29a, 2-34b, 2-35a, and 3-13a.

Likewise, the proposed use of another even-aged management technique (the overstory removal in Stand 3-16a) is consistent with the framework set forth for MA 2.1 lands in the Forest Plan. Potential environmental, biological, aesthetic, engineering, and economic impacts have been assessed for each timber stand and are disclosed in Chapter 3 of the Environmental Assessment. Stand prescriptions for even age management determinations are confirmed as being appropriate. The Decision Notice/FONSI documents these conclusions.

Comment: It was noted that including the number or placement of skid trails in the EA would be helpful in commenting on the effects of skidding.

Response: The miles of proposed skid trails and number of skidder crossings on perennial streams are noted in Table 9 in Section 3.12 of the EA. Effects of skid trails on various resources are considered and disclosed in the EA as follows: Fish and Aquatic Habitat (Section 3.3), Heritage Resources (Section 3.4), Non-native Invasive Species (Section 3.6), Soils (Section 3.10), Vegetation (3.11), and Water Resources (Section 3.12).

Comment: The commenter believes the process used in the Forest Plan for determining the suitability of lands for timber management was flawed, and believes that land in the project area is improperly allocated to MA 2.1, which allows commercial timber harvest. The commenter's concerns relate to: failure to consider physical and biological conditions in Stage II of the suitability determination; failure to consider transportation requirements in Stage II of the suitability determination; exaggerated

stumpage values; data used was inaccurate or insufficient to calculate costs; incorrect costs and revenues applied in Spectrum; failure to adequately conduct Stage III of the suitability determination; inclusion of non-cost efficient lands in the suitable timber base; the Spectrum goal programming model: a violation of 36 CFR 219.14. The commenter requests reconsideration of the suitability determinations at this time.

Response: At the programmatic level, the process of determining suitable forest lands (lands managed for timber production on a sustained yield basis, see 16 U.S.C. 1604(k)) was completed as part of the recent Forest Plan revision process. See Forest Plan FEIS tables 3-27 and 3-28, pages 3-124, 3-125, and Appendix B (USDA Forest Service 2005b). The comment here focuses on that portion of the suitability analysis involved in the Mill Brook project area. As part of the site specific analysis, the suitability of the acres proposed for harvest as part of the Mill Brook Project was confirmed. Lands identified as suited for timber production were considered during the Mill Brook Project analysis. Project-level analysis includes on-the-ground field examinations to verify suitability for timber production; essentially field-checking the Forest Plan-level analysis. In the case of the Mill Brook Project, after visiting Stand 2-38 and examining the rocky terrain, the IDT determined it is in fact not suitable for timber production and deleted the stand from the stands proposed for harvest under Alternative 2 (see Section 2.2). Please refer to the Decision Notice for further discussion on land suitability in the Mill Brook project area.

Comment: The commenter believes that early tree-marking indicates "a decision has already been reached for this project and that it won't matter what comments are received…." and also notes that the Forest Supervisor stated in the past that painting boundaries won't occur until after a decision on a project has been reached. The commenter goes on to question the Forest Service's commitment to public involvement by stating, "If the Forest Service really wanted comments from people "on the ground" why did it release this EA when 4 feet of snow were on the ground?"

Comment: The commenter expresses identical concerns as above regarding pre-decisional tree-marking and the Forest Service's commitment to public involvement, adding that painted boundaries of Alternative 2 stands would seem to preclude the selection of either Alternative 1 or 3. If this is not the case, the commenter wonders about the cost to unmark trees.

Response: The marking of unit boundaries and harvest trees does not indicate that a decision has been reached prior to the public comment period. At the time the first commenter was in the project area, the marked units were those that are common to Alternatives 2 and 3, either of which might have been the selected alternative.

Harvest units whose marking guidelines differ by alternative are marked after the preferred alternative is selected. Forest Supervisor Wagner has stated units that differ by alternative will be marked only when the Responsible Official has made a decision, which is, in fact, the selection of the preferred alternative. When this selection is made, the Decision Notice and Finding of No Significant Impact are written, with the completion of tree marking in the preferred alternative occurring simultaneously. If a change in unit/tree marking is necessary after a decision is made, the units/trees that have been marked can be blacked out with paint. The marking of trees does not represent an irretrievable or irreversible action.

The selection of the preferred alternative for the Mill Brook Project occurred after consideration of the environmental, social, and economic effects disclosed in the Preliminary EA as well as the public comments received during its formal 30-day review period in February and March 2008. The Decision Notice elaborates on the specific rationale for selecting Alternative 2 in the Mill Brook environmental analysis.

Please see Section 1.3 of the EA for a description of the public involvement efforts conducted as part of the analysis, and how the public contributed to the development of the proposed action and alternatives, and how public comments were used in the environmental analysis that led to the decision. In addition to mailings and web postings to announce the analysis and seek public comment, a field tour of the project area was held in June 2006 to seek further public input. The commenter questioning the release of the EA was one of several members of the interested public present at this field tour and acknowledged receiving maps of the project area in electronic correspondence with Androscoggin District personnel in September of 2006. The District received no further requests, questions, or comments regarding the project from this individual until February of 2008. The 20 months between the field trip and release of the preliminary EA provided ample opportunity for a field examination of the project on snow-free ground.

Comment: The commenter wonders why the predicted 8.65 miles of skid trails and 35 acres of disturbed area appear to be lower than other comparable projects on White Mountain National Forest, and also wonders if the 8.65 miles include all skid trails.

Response: The existing road system in the Mill Brook Project area was placed to provide the most efficient access to timber (also see transportation response to comments in Appendix B of the EA). Nearly 60% of the stands proposed for treatment are bordered or are crossed by haul roads. The presence of these existing roads results in a need for fewer miles of skid road and less acreage disturbed in the project area. In comparison, only 40% of the stands in the North Kilkenny Vegetation Management Project (approximately 1,000 acres) are accessed in the same manner, so more miles of skid roads were necessary. The mileage shown in Table 9 is an estimate of the miles of skid trails that would receive more than three round trips. As mentioned in the soils section of Chapter 3, skidding activities where a single pass up to three passes occur do not normally produce measurable effects on soil resources. This is especially true when skidding occurs on frozen ground. Past experience and monitoring indicate that secondary skid trails (less than three round trips) do not result in long term direct or cumulative effects. Skid trails are located on the ground by an experienced sale administrator, where they best protect resources. Additionally, all skid trails that have the potential to result in overland flow are waterbarred, thereby preventing sustained measurable adverse resource effects.

Comment: The commenter wonders if modern equipment meant fewer landings would be necessary, but understands that longer skidding distances are expensive.

Response: The number of landings chosen to access timber offered as part of any timber sale takes into consideration several factors including the type of harvesting equipment and skidding distances. Site factors including topography, soil type and logging truck access are also evaluated. Whenever possible, landings are located for future use, evidenced by the use of existing landings associated with this proposal.

Where applicable, the resource effects analyses in Chapter 3 of the Mill Brook EA include an evaluation of landings.

Comment: The commenter supports the "No Action" alternative due to a lack of "an immediate need for this project," stating that aside from decommissioning roads and stabilizing a road that may erode into or damage streams there is no immediate need to offer the forest area to the highest bidder.

Response: The comment suggests that the purpose and need for the project are not accurate. Although we would agree that there is no emergency (e.g. hazardous fuel reduction, or insect infestation), there is a clearly well-documented need to take action in the project area for forest health and wildlife habitat reasons (EA, section 1.1). We note that typically the timber harvest in any one area of this Forest is cyclical, based mostly on harvest history, existing stand conditions, and wildlife habitat objectives. Thus, while there are no unexpected circumstances warranting an urgent response, the field work for this project demonstrates a pressing and real need to take action at this time to address declining resource conditions and improve plant and animal diversity within the project area. The trade-offs or consequences (particularly to wildlife habitat type and age class) of taking no action (Alternative 1) are clearly described in the record. A broad-based, ecological view of the need as well as consequences underlies this project. Whereas action can always be postponed, and more information gathered, there are ecological and resource consequences for this HMU associated with further delay. The IDT carefully weighed and balanced the need for action, potential effects (especially socio-economic or recreation effects), and the longer-term environmental benefits in developing this project. Public involvement has played a key role in project design.

The HMU analysis in the project file details the lack of diversity in age class and habitat type. As the Forest continued to evaluate the possibility of proposing action within the Mill Brook HMU, subsequent federal court decisions regarding the 2001 Roadless Area Conservation Rule, additional site specific field exams, and further resource analysis further limited the size of the area available for vegetation management. Over time, the proposal has evolved from vegetation management of 2,300 acres and 8.4 MMBF to the present proposal of approximately 1,034 acres and 3.52 MMBF.

While the purpose and need for the Mill Brook project may not support an emergency action, the analysis of existing conditions documented in the purpose and need statement (EA section 1.1) vividly describes the pressing need and eventual benefits of taking action in the project area at this time. We are confident based upon field work, lessons learned over decades of similar projects, consultation with local experts and review of the best available science that applying proven silvicultural techniques as constrained by Forest Plan standards and guidelines and other protective measures will help us reach vegetation and habitat goals for the project area. Forest products for local mills will be generated as the byproduct of a vegetation management action that results over time in a healthy and vigorous forest. See the EA, Sections 1.1 and 3.11 for more details regarding the choice to harvest timber in the Mill Brook area.

9. Wildlife

Comment: "The preliminary EA seems to imply that once a decision is made, the wildlife openings would be able to be maintained in the future without any subse-

quent NEPA analysis or direction. We believe some level of NEPA analysis will always be done before subsequent maintenance activity."

Response: We agree that the statement "every 3-5 years" implied that our decision on this project authorized on-going maintenance into the future without further environmental analysis. That is not what was intended and we have clarified the wording in the EA. This project does not authorize maintenance of the wildlife openings beyond the next 3-5 years, but the analysis did examine the effects of possible future maintenance of these openings as a reasonably foreseeable future action. Any future maintenance beyond 3-5 years of this decision will be examined as directed by our environmental analysis regulations found in 36 CFR 220. Wildlife opening maintenance is examined either as a part of integrated project proposals, such as the Mill Brook Project, or through a Forest-wide environmental analysis, whichever is most efficient and timely for meeting the wildlife habitat needs and objectives on the ground. The White Mountain National Forest is currently conducting a forest-wide analysis to continue maintenance of existing permanent wildlife openings and scenic vistas on the Forest and to add any new openings to the Forest-wide database (see http://www.fs.fed.us/r9/forests/white_mountain/projects/projects/assessments/forest-wide_wlo/forest-wide_wlo.html for analysis).

Comment: The commenter states that there is no need to create early successional habitat in the WMNF, and that trend data and statements in the Assessment of Terrestrial Biodiversity in the White Mountain National Forest Region (Cline, et al.1999) directly contradict one of the purposes of the Mill Brook Project, causing a flawed analysis and casting doubt on the purpose and need for the project and the Forest Service's entire premise that it must increase early successional habitats in the White Mountain National Forest because it is declining in the region.

Response: Many sources of information were used to develop the wildlife habitat goals found in the White Mountain National Forest Plan. The Terrestrial Assessment (Cline et al 1999) was used during this process as it was originally intended – as a compilation of information and scientific resources. The Forest contracted with Dr. Cline and others not to produce a scientific study in its own right, but instead to compile existing science to be used as guidance or a literature review in the development of the programmatic White Mountain National Forest Plan. A review of the Terrestrial Assessment by Forest Service staff and many other peers during Plan revision identified relevant information that was not included in the assessment (Lemieux 2007), and some reviewers expressed concern about the data analysis methods used by Cline et al. (Peer Reviews in Project File). The inadequacies and potential bias in the document identified during the peer review process made it necessary to consider the Terrestrial Assessment literature review as just one source of literature in the development of wildlife habitat goals for the White Mountain National Forest.

A recent study on scrub/shrub birds in New England, subsequent to the literature compilation in Cline, et al., provides compelling evidence as to the importance of early successional habitat (Schlossberg and King 2007). This publication discussed the value of early successional habitats for 41 bird species in New England including American woodcock, chestnut-sided warbler, magnolia warbler, and mourning warbler. Approximately 21 of these 41 bird species are declining, some at an alarming rate. Many of these birds are habitat specialists that occupy areas with a certain vegetative structure – shrubby open habitat -- that occurs on the landscape for a very short time frame. Of note is that 78% of habitat currently used by these species is

created through logging. Other habitats important to this suite of species include shrubby wetlands, permanent wildlife openings, and old fields. Without some type of repeated natural or manmade disturbance this habitat disappears quickly. This recent publication analyzed how abundant early successional habitat is across New England including acres created by forest management on privately owned lands. This is based on 2006 Forest Inventory Data and Gap Analysis data in New England. Another recent publication by the Northeastern Forest Research biologists also discusses the critical need for early successional habitat for certain species of wildlife (DeGraaf et al. 2006, page 19). In addition, our Forest Plan analysis indicates a desire expressed by the public (including wildlife professionals) for the White Mountain National Forest to provide some amount of this habitat type (USDA Forest Service p. 1-13, 3-83 to 3-84).

Analysis of the Mill Brook HMU and the cumulative effects analysis area indicates a lack of early successional or regeneration forest habitat (see Section 3.15 in the EA). The need for an increase in early successional habitat in this HMU is based on the goals of the Forest Plan, the scientific evidence as to the importance of regeneration forest habitat, and the small percentage of high quality early successional habitat in either the HMU or the analysis area.

Comment: "Diversity of plant and animal communities will be adversely affected because logging inherently simplifies forest structure and the clearcutting proposed will cause forest fragmentation. This simplification and fragmentation has the potential to adversely affect habitats for sensitive species that benefit from undisturbed areas of land. Most of the stands proposed for logging have not been entered for many decades and represent the reference landscapes that are unique and rare in IRAs of the White Mountains and the eastern United States."

Response: There is a steady and ongoing history of timber harvest, growth, and re-harvest in the project area. The Forest presently found in the project area is itself the product of a cycle of harvest and regrowth; the area is neither pristine nor virgin forest. Some of the stands proposed for harvest were last harvested several decades ago, while others were logged more recently. One stand was thinned in 1979 and another in 1988. Another stand had an uneven-aged harvest in the 1960s. Other stands in the project area have records of past harvest activities. There is evidence of numerous old logging roads in Stand 2-34, indicating past harvest activity. Although over half of the Forest is presently allocated to older forest conditions, there are no old growth stands in the project area.

Most of the wildlife habitat on the White Mountain National Forest is mature, with some early successional habitat created either naturally or from timber harvest. These disturbance habitats favor a certain suite of plant and animal species while the unmanaged portions of the Forest and the mature forest provide habitat for a different suite of plant and animal species (DeGraaf and Yamasaki 2001). This strategy of managing for a variety of habitat types and age classes results in a wider variety of plants and animals across the landscape. In the case of rare species of plants and animals, habitat management focuses on conservation to protect the site and population (USDA Forest Service 2005a, p. 2-15).

Scattered regeneration harvests in the Mill Brook Habitat Management Unit over time is viewed by some as fragmentation, however, research has found no evidence of the 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 III et al. 1992, DeGraaf et al. 2006, page 8). Therefore clearcutting in a heavily forested landscape such as the White Mountain National Forest generally does not have significant adverse forest fragmentation effects (USDA Forest Service 2005a, p. 3-196 through 3-197). Suitable habitat for forest interior wildlife species will be maintained under Alternative 2, with approximately 80% of the lands in this HMU remaining in the mature age class after the planned harvests. The project will provide much needed early successional habitat within the HMU and provide for diversity of plant and animal communities within a multiple use context as directed by NFMA, 16 U.S.C. Section 1604(g)(3)(B). NFMA does not mandate preservation of any particular type of Forest habitat, but provides discretion to field land managers to manage according to local resource conditions. The consequences of no action, i.e. allowing all of the HMU to become mature habitat were likewise considered. The no action alternative does not result in desired wildlife habitat diversity within the HMU.

Comment: The commenter states that Canada lynx are acknowledged to have been found in the project area and asks "Were any project specific surveys conducted to search for the presence of Canada lynx? If so, when and what survey methodology was used? Given that lynx have been found in the area, what measures would be taken to minimize disruption should they be spotted in or around sale units prior to harvest?"

Response: Canada lynx have been confirmed in the southern portion of the Kilkenny Unit of the White Mountain National Forest (Biological Evaluation, Project File), but not in the project area. Although the potential for lynx in the project area exists, none have been detected (see survey information below). The U.S. Fish and Wildlife Service confirmed that the proposed vegetation management activities in the Mill Brook project area will not adversely affect Canada lynx (1/31/2008 Letter from USFWS, Project File). If a lynx was confirmed in the project area we would consult USFWS and follow their recommendations.

Annual winter tracking surveys across the Forest search for presence of mammal species including Canada lynx along established transects. The sample design follows the White Mountain National Forest winter tracking protocol (document in the project file). One of these survey transects is located just south of the project area and has been surveyed twice each winter since 2005, with no detection of Canada lynx tracks (unpublished WMNF data 2005-2008). Mammal track counts were conducted in the project area in the early 1990s, with no Canada lynx tracks detected (unpublished WMNF data).

Standards and Guidelines in the Forest Plan (USDA Forest Service 2005a p. 2-16 and 2-17) ensure that suitable habitat is maintained for Canada lynx should they recolonize the Forest.

Comment: The commenter wonders why the Forest Service continues to propose early successional habitat when the NH Big Game Plan recommends keeping the moose population steady and decreasing the bear population in the White Mountain region, including the following link to the State's report: <www.wildlife.state.nh.us/Hunting/Hunting_PDFs/NH_Big_Game_Plan05DRAFT.pdf>.

Response: The NH Big Game Plan has different objectives than the wildlife habitat goals outlined in the Forest Plan. The population goals in the NH Big Game Plan are used as a basis for setting annual hunting seasons and the number of permits for each

big game species in the State. These State-wide goals for moose and bear management are based on a variety of factors including social, economic, ecological conditions, and public safety and ecological (New Hampshire Fish and Game Department Big Game Plan, Project File). The Mill Brook project area is in the State Wildlife Management Unit (WMU) C1 in the cited report, where the objective is to reduce moose density in order to reduce the potential for vehicle collisions without reducing hunting or viewing opportunities. The State goal for bear density has some biological sideboards but is influenced by the public, often due to nuisance problems (Timmins 2008).

The wildlife habitat goals in the Forest Plan, including managing for early successional habitat, are based on the habitat needs of the full array of wildlife species that occur on the Forest for all or part of the year. Moose and bear are just two of the many wildlife species that benefit from an array of habitat types on the White Mountain National Forest (DeGraaf and Yamasaki 2001). Implementation of the Mill Brook project will result in changes to existing habitat condition in the Mill Brook HMU. While creation of some early successional habitat will provide a temporary food source for moose and bear, it is unlikely that this would increase moose and bear populations in the area. These effects on moose and bear would not be inconsistent with the State Plan.

Comment: The commenter wonders if the proposal to create early successional habitat is to ensure that the bird populations remain viable, and if so why weren't the "massive clearcuts that are in the Jericho State Park which is around 10 miles away from the Project Area" counted? They should have been included in the acres of regeneration harvest in the area.

Response: The habitat goals of the White Mountain National Forest are to provide a diversity of habitats including different forest types and age classes for the full array of wildlife species that inhabit the Forest (USDA Forest Service 2002b, USDA Forest Service (FEIS) 2005b, Chapter 3 (page 73-110, 166-187).

In evaluating the effects of this project on existing versus desired habitat composition and age class objectives (including early successional habitat), habitat condition in the HMU where the project area is, in surrounding HMUs and on adjacent private lands may be considered. Private lands are often included in the habitat analysis; however it can be difficult to determine how far, and in which direction, effects may be noticeable. The harvested area in Jericho State Park are approximately 10 miles from the project area. Whereas the IDT was aware of the action on State land, it determined that this action was outside the cumulative effects analysis area. . See Section 3.15 in the EA for our rationale in defining the cumulative effects area for wildlife.

Comment: "On page 98 of the EA the Forest Service says "without regeneration forest habitat created by the proposed clearcuts, species that favor aspen-birch and regeneration forest habitat, such as the chestnut-sided warbler, magnolia warbler and ruffed grouse might start to decline in the project area…however the Mill Brook Bird surveys furnished by the Forest Service still show chestnut-sided warblers and magnolia warblers in the Project Area and the following pictures taken during my walk at Mill Brook show quite a few grouse still inhabiting the area. What will happen to them if you cut these trees and change the habitat?"

Response: Species that use regeneration age forest for all or part of their life cycles are present in the project area, including chestnut-sided warbler, magnolia warbler, and ruffed grouse (survey data available in the Project File). The survey transects through the project area include early successional and mature habitats as well as pockets of

natural disturbance. Moreover, ruffed grouse use a combination of mature and early successional habitat, favoring mature habitat in the winter and early successional habitat in the summer. Harvesting timber will cause direct effects to individual birds (see Wildlife Section of the EA), for example clearcutting will displace some individuals that favor mature habitat. Existing regeneration-age dependent species may be disturbed temporarily when summer logging occurs, but will have more available habitat in the future. The IDT examined and disclosed these effects, and considered the trade-offs to wildlife that favor various type of habitat. Overall, the project will result in a greater diversity of wildlife habitat types and age classes, improving the resiliency of the forest. This action is consistent with Forest Plan direction and will move the project area towards the desired future condition.

Comment: "The EA states that individual eastern small-footed myotis' may be affected by this project. Since scientists currently have no idea what is causing white-nose syndrome (WNS) or the extent of how this is going to affect the bat populations in the Northeast can we afford to lose any bats? This project should be put on hold until a cause is determined and mitigation measures can be put in place to ensure the viability of this species. The WMNF could see the terrible disease spread onto Forest lands or end up as a sort of refugia for uninfected bat populations. What will the Forest do to lessen the likelihood of spread should the forest bat populations be disease free? What cumulative impacts would result from the additional stressors of timber harvest in the area if the bat population has white nose syndrome? Would this affect season of harvest? What communication has the WMNF had with the US Fish and Wildlife Service (USFWS) about this disease, particularly its effects on Indiana bat and eastern small footed bat?"

Response: The White Mountain National Forest is very concerned about White-Nose Syndrome (WNS) in bats. There are many unknowns about White-Nose Syndrome, although more is being learned every day. We are in close communication with the U.S. Fish and Wildlife Service (USFWS), who is the lead agency for WNS because of the potential effects to federally listed bats elsewhere. The USFWS is working in close cooperation with States and many university and research laboratories to learn more about the cause and possible spread of WNS. They maintain a web site containing some of the most recent scientific information on this syndrome at: http://www.fws.gov/northeast/white_nose.html. The White Mountain National Forest will follow the lead of the USFWS and take appropriate action as needed.

Currently there are no known bat hibernacula on the White Mountain National Forest. Recent surveys of New Hampshire hibernacula by two bat experts found no evidence of WNS (von Oettingen 2008). To date no confirmed cases of WNS have been found on or near the White Mountain National Forest. However, there have been some reports of dead and dying bats in some buildings in New Hampshire this summer. Some bats also have been caught this summer that have white spots, holes, and tears in their wings and there are reports of the bat pups dying. It is not known if this condition was contracted in the state or if these individuals were weakened in their winter hibernacula prior to leaving (see above USFWS website). At this time, the recommendations developed by the USFWS and their partners to prevent the spread of WNS focus on human visitation or research in affected hibernacula, human visitation between affected and unaffected caves and mines, and human handling of affected bats. Neither the USFWS nor the State wildlife agencies have taken any management action with regard to WNS in New Hampshire.

There are no federally listed bats occurring on the White Mountain National Forest. However, WNS potentially could affect other woodland bat species that do occur here. Of special concern is the eastern small-footed bat, a Regional Forester Sensitive Species. As discussed in the Biological Evaluation for the Mill Brook project, WNS could potentially affect this species if it moves to the WMNF. However, it is unlikely that proposed activities that harvest trees would result in cumulative effects to eastern small-footed myotis as the literature indicates that this species does not favor roosting in trees during the non-hibernation season (Kiser et al. 2001, 2002, Veilleux 2005, 2006, 2007).

Several other woodland bat species are known to occur on the White Mountain National Forest. They are not currently considered rare (despite losses from WNS over the past 2 winters), but do roost in trees. As described in the Wildlife effects section of the EA, timber harvest has some potential to add cumulatively to negative effects produced by WNS. Winter harvests would have no cumulative effect because bats would not be roosting in trees during winter. Summer/fall harvests, though, potentially could impact bats by removing occupied roost trees. These effects, though, are considered small because: 1) Forest Plan standards and guidelines exist to protect and retain wildlife reserve trees which could provide roost tree habitat (there may be greater loss of potential roost trees on private lands as harvest activities may not follow the same guidelines to reserve snags and wildlife trees); 2) the amount of annual timber harvest planned in the Mill Brook project or South Pond HMUs as well as the forest on adjacent private land is small in relation to the total forested area on the White Mountain National Forest and across New Hampshire; 3) suitable roost tree habitat is abundant across the Forest; and 4) some harvests can result in beneficial effects by allowing solar radiation to improve roosting habitat.

On a Forest-wide basis, we have taken some additional steps to help inform this issue. We have alerted all Forest Service employees to report any dead bats found on the Forest, as well as any sightings of unusual bat behavior. In addition, we plan to complete some acoustical bat monitoring in the near future, which will help provide useful data on general bat numbers at various locations. We will continue to maintain close communication with the USFWS and state wildlife agencies and will follow recommendations as they develop.

Comment: "I am writing to request that the US Forest Service not log in the Kilkenny Roadless Area. It will undoubtedly threaten the lynx and moose. It is one of the last isolated areas and should be left that way. The surrounding private lands are heavily logged and roaded."

Response: The effects of Alternative 2 (which includes activities on land identified as part of the roadless area inventory in during Forest Plan revision) on Canada lynx are discussed in the Biological Evaluation (Project File) and summarized in Section 3.16 of the EA. The overall conclusion is that the potential is low that Canada lynx are present in the project area, but if there, individuals would be affected for a short time during project activities. Suitable habitat will be maintained or increased with project activities, and in the longer-term efforts to increase spruce-fir habitat will benefit lynx. The effects on wildlife are discussed in the Wildlife Section of the EA (Section 3.15), with no adverse effects predicted for moose. The analysis of effects on wildlife habitat and vegetation included examination of recent harvesting on private lands both within and adjacent to the project area. The effects are discussed in the EA in Sections 3.11, 3.15, and 3.16.

10. Preservation

Comment: "My personal belief is that the most important goal for all natural forest lands is primarily to protect the natural environment and allow only nature, apart from man's influence, to control the way things survive on these precious lands…I hope the least amount of area as possible to be disturbed by the logging and other invasive activities."

Comment: "Given the current realization of all we have done to harm the earth, and the consequences thereof, it is alarming to think that yet another area may yet fall under the human axe of destruction."

Comment: "I respectfully and urgently implore you to intervene and not allow logging in the Kilkenny Roadless Area, ever. It is vital to our spiritual and physical health that we protect wild places -- all the more so when so few remain."

Response: Most of the lands comprising the White Mountain National Forest are managed landscapes with a long history of human use. Today, more than half of the land we care for is managed for goals and conditions that preclude timber harvest. Our 148,000 acres of designated Wilderness are preserved to retain the land's "primeval character and influence…. affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable…..has outstanding opportunities for solitude or a primitive and unconfined type of recreation….. and may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value (Wilderness Act of 1964). Yet even in Wilderness we have hiking trails and other elements of human activities to manage, which we do in a way that protects the Wilderness values and characteristics.

We also manage lands outside of Wilderness that have minimal human influence -- vast areas of backcountry serve as places of solitude and remoteness, with little development or activity, and no timber harvest allowed.

Prior to federal ownership in the early 1900s, land in the White Mountains was heavily logged and burned, supported by a network of railroads and many poorly designed roads traversing the valleys and hillsides. The land became the White Mountain National Forest for the purpose of restoration and rehabilitation of the land and watersheds, which has been enormously successful as we can see from any summit or brook in or near the Forest.

We understand the role the national forest plays in the region as a place for people to come for renewal and connection to nature. The White Mountain National Forest provides such a place for many people while also providing wood products to meet society's needs. We value and protect all the land we manage for many uses, including timber harvest. Both NFMA and MUSYA contemplate timber harvesting on the National Forests. The Forest Plan allows for timber harvest as a tool for moving areas toward the desired future condition, but does not authorize any site specific action. While timber harvest does often have short-term effects and disturb the land, we apply standards and guidelines to protect soils, water, wildlife, scenery, plants, and many other resources to ensure that potential adverse effects are mitigated. These mitigation measures are mandatory and implementable, and have proven effective in past applications on the Forest. Much effort has been invested in the development of a project, with public input, that protects soil, air, water, wildlife, and other resources. The short term effects and long-term benefits have been carefully weighed. In addition

to timber harvest, the Mill Brook project will also fix erosion problems along the brook and maintain existing roads to prevent future problems. Please see the discussion of environmental effects in Chapter 3.

11. Climate Change

Comment: "The Service must assess climate change impacts in its NEPA review. Federal courts have determined that federal agencies must assess carbon dioxide emissions and other climate change impacts in project analyses. Mid States Coalition v. Surface Transp. Bd., 345 F. 3d 520, 532 (8th Cir. 2003); Border Power Plant Working Group v. Dept. of Energy, 260 F. Supp. 997 (S.D. Cal. 2003); Center For Biological Diversity v. National Highway Traffic Safety Administration, No. 06-71891 (9th Cir., 2007). This requirement exists because of the enormous threat posed to the nation and its public lands by climate change.

The consequences of climate change have been well documented by scientists both globally and within New England. See IPCC, Fourth Assessment Report: Climate Change 2007 (2007) (available at www.ipcc.ch/ipccreports/assessments-reports.htm); New England Regional Assessment (NERA) Group, Preparing for Climate Change: The Potential Consequences of Climate Variability and Change—New England Regional Overview (2001) (Chapt. 5, "Climate Impacts on Regional Forests") (available at www.necci.sr.unh.edu/2001-NERA-report.html); Northeast Climate Impacts Assessment, Confronting Climate Change in the U.S. Northeast: Science, Impacts, and Solutions (2007) (available at http://www.northeastclimateimpacts.org).

These studies have shown that the results of climate change have already, and will increasingly, involve substantial climatic disturbances such as rising temperatures, extreme weather events, seasonal changes affecting flora and fauna, increased invasive species, species migration, more ground level ozone, and worsened air quality.

Due to the severity of the threat that exists to our national forests from climate change, the Forest Service is required to account for these detrimental effects by 1) expressly addressing the consequences of specific proposed projects before implementation, 2) assessing the benefits to climate and climate-related conditions by not undertaking the proposed project, and 3) considering the best way to utilize the national forests to meet the needs of the American people in light of climate change. See 16 U.S.C. § 1602(5)(F).

Climate change is already altering the characteristics of our northern New England forests. See Beckage, B., A rapid upward shift of a forest ecotone during 40 years of warming in the Green Mountains of Vermont, Proc. Natl. Acad. Sci. USA (2008). In such a rapidly changing and uncertain environment, there are few answers, or even reasonable guesses to such questions as: What will future forest-growing conditions be like? Which species will be favored at different elevations and in different locations? How will logging affect or alter community composition?

Given the climatic shifts and stresses already bearing heavily on our forests, the Forest Service must take an extremely cautious approach to manipulation of standing forest communities. Logging could accelerate the changes already occurring (e.g., by increasing run-off and sunlight, logging could increase soil surface temperatures and diminish soil moisture, thereby favoring more drought and heat-tolerant species).

Furthermore, there is now considerable scientific evidence that retention of older forests allows for greater carbon storage than logged or young forests. In forests that have been studied, logging causes a net increase in carbon emitted into the atmosphere. See e.g., Grant, R. F., Changes in net ecosystem productivity with forest age following clearcutting of a coastal Douglas-fir forest: testing a mathematical model with eddy covariance measurements along a forest chronosequence, Tree Physiology Vol. 27, 115–131 (2007); Pregitzer, K. S., Carbon cycling and storage in world forests: biome patterns related to forest age, Global Change Biology Vol. 10 No. 12, 2052-2077 (2004); Carey, E. V., Are old forests underestimated as global carbon sinks?, Global Change Biology Vol. 7 No. 4, 339-344 (2001).

The Forest Service must incorporate the latest scientific knowledge with regards to carbon flow and carbon storage in forests as part of its analysis of the impacts of the Mill Brook project on the human and natural environment. We feel that this intensive analysis should be set forth in a complete EIS."

Response: These comments touch on two aspects of climate change: adaptation (for example, "How will logging affect or alter community composition?"), and mitigation (for example, "there is now considerable scientific evidence that retention of older forests allows for greater carbon storage than logged or young forests"). Our response to these comments will emphasize mitigation, specifically sequestration; our response to additional comments below will emphasize adaptation.

In relation to both mitigation and adaptation, federal court decisions to date are consistent with NEPA principles that call for the scope of analysis to be commensurate with the impacts of a proposal (40 CFR 1500.4(c), 40 CFR 1502.2(b)). The cited cases pertain to major sources of greenhouse gas emissions (coal-fired power generation and automotive fuel economy standards). We believe that the scope of our analysis is, in fact, commensurate with the effects of our proposal. The proposal is for sustainable forestry, which is considered to contribute to carbon sequestration and substitute for fossil fuels. See Union of Concerned Scientists (2004); "Recent estimates show that U.S. forests, grasslands, and agricultural lands form a sizable carbon sink. Even a forest that undergoes regular harvesting can act as a carbon sink as long as early growth exceeds the amount of carbon removed during harvest. The U.S. carbon sink absorbs 1.1 to 2.6 million metric tons of CO2 each year, which is equivalent to 20 to 46 percent of total U.S. global warming emissions.") Also see Salwasser 2006 (pp. 13-15) and Krankina and Harmon 2006. In conformance with the Forest Plan, the proposal and alternatives are based on rotations that are longer than typical of other ownerships, and will provide for increased resilience to insects and disease. Most of our forest stands that are on MA 2.1 lands and available for timber harvest are managed under uneven-aged systems which do not have particular rotation ages, but instead have periodic partial harvests which perpetuate stands of diverse age classes and species. For those stands managed with even-aged management, our rotations are typically longer than private timberlands, which tend to change ownership regularly and thus it is unusual for forest stands to have long rotations.

At the stand level, the best available science shows that harvesting results in carbon emissions over the short term, followed by longer-term sequestration (See Krankina and Harmon 2006: Figure 2). Literature cited by commenters describes old growth forests as carbon sinks, but also indicates that young forests tend to be faster carbon accumulators. Clearly the effects of harvesting, or not, on carbon levels depends on a lot

of variables. Carbon accounting at the stand or project level is still at a conceptual stage (for example, see Cathcart and Delaney 2006), and a subject of on-going research.

Landscape-scale (or larger) analyses may be more meaningful. For example, see Intergovernmental Panel on Climate Change (IPCC) 2007 (pp. 549, 551), which states "Landscape-level carbon stock changes are the sum of stand level changes, and the impacts of forest management on carbon stocks ultimately need to be evaluated at landscape level. Increasing harvest rotation lengths will increase some carbon pools (e.g., tree boles) and decrease others (e.g., harvested wood products [citation omitted].") The White Mountain National Forest is currently working with the University of New Hampshire to identify the carbon storage and establish a carbon budget based on the activities approved in the 2005 Forest Plan, but this larger-scale analysis is not complete.

At this time, what we do have are national data on sequestration. As required by the cited section of the U.S. Code, the Forest Service has prepared regular summaries of the effects of global climate change on forest and rangeland conditions. The most recent (2007) summary is available in the Interim Update of the 2000 Renewable Resource Planning Act Assessment (see especially pages 69-72, 74, 77 and 83-85; with the latter summarizing forest sequestration of carbon and avoidance of emissions through the use of wood products). The assessment and related studies underlie EPA greenhouse gas inventories for the forestry sector, which conclude that improved forest management practices, afforestation, and timber harvesting and use have resulted in net sequestration of carbon each year from 1990 through 2005. In 2005, land use, land-use change, and forestry activities resulted in a net carbon sequestration of 828.5 Tg CO2 equivalents. This represents an offset of approximately 14 percent of total U.S. CO2 emissions. Total land use, land-use change, and forestry net carbon sequestration increased by approximately 16 percent between 1990 and 2005, primarily due to an increase in the rate of net carbon accumulation in forest stocks (United States Environmental Protection Agency 2007c: 7-1 to 7-2). These estimates include consideration of above- and below-ground biomass, dead wood, litter and soil organic carbon, and include the effects of forest fires (United States Environmental Protection Agency 2007c: 7-2 to 7-4). The Forest Service's Northern Research Station is investigating soil carbon storage and carbon litter cycling on the White Mountain National Forest. The pattern of net sequestration reflected in the EPA inventory is expected to continue for the foreseeable future, although at a reduced rate because of factors such as forest maturation and clearance of private land for development (United States Department of Agriculture, Forest Service 2007: 84; Union of Concerned Scientists 2004).

We do not believe it is realistic or necessary to pursue a carbon accounting at the project level for two reasons. First, the best available science indicates that sustainable harvest practices result in net sequestration of carbon over time, even when harvest operations, transportation, stand-tending and manufacturing are taken into account. Markewitz ("Fossil Fuel Carbon Emissions from Silviculture: Impacts on Net Carbon Sequestration in Forests" Forest Ecology and Management 2006) concluded that a high-intensity pulpwood management scheme would result in little or no long term sequestration, while carbon storage in wood products due to accelerated growth of trees to a saw log category might exceed the incurred emissions by 3-fold (i.e., 35 Mg ha−1). His calculations showed that there is a net carbon benefit to all but the most intense, shortest-rotation management systems. The Forest Plan does not support pulpwood rotations or high-intensity pulpwood management schemes. Our

management is based on longer rotations than those modeled by Markewitz, Gower and Ahl (2006) concluded that whether forest management results in a net source or sink of carbon is dependent on many factors, especially the size of the area examined. At the harvest site level, there was a net loss of CO2 over 1-5 years because of decomposition of harvest residuals (slash, etc.). Over the longer term, the extent of the area used in the calculations influenced whether the area was a source or sink. The National Forest studied (the Chequamegon-Nicolet) was a net carbon sink. They concluded that "The normal harvest with climate change had the largest net biological and industrial carbon sequestration (p. 46)."

The second reason project level carbon accounting is not appropriate is because there is no reason to believe that the carbon benefits from the selection of any alternative (including no action) would be realized. Wood from other sources, or products that are more carbon-intensive, could readily be substituted for products that would be made available through implementation of the proposal ("leakage," see Cathcart and Delaney 2006: 160). For example, if the pulp products were obtained from industrial forestlands with shorter rotations, carbon sequestration potential would be less. The potential carbon benefits of foregoing action, or choosing a particular action alternative, are too tenuous to be useful in decision-making. All in all, we believe that the information presented and cited in our response to scoping comments (Appendix B) remains relevant and accurate. We would add, however, that the Forest Service is continuing and expanding its activities in the area of climate change and carbon sequestration. Summaries are available from http://www.fs.fed.us/kidsclimatechange/climate.shtml, and http://www.fs.fed.us/ecosystemservices/carbon.shtml. Also as stated above, the White Mountain National Forest itself is examining the carbon balances associated with the Forest Plan.

Comment: "We do not believe the effects of climate change have been adequately addressed. The body of the Preliminary EA is largely silent on climate change. Appendix B, Scoping Comments and Responses addresses climate change, but primarily in one direction. The response in the appendix seems to focus on the contributions the Mill Brook Project might or might not have on global warming. However, we are also interested in the effects climate change and global warming might have on achieving the goals set forth for the Mill Brook Project.

Response: These effects do not seem to have been addressed. We believe they should be. For instance, what do climate models say about the continued existence of the spruce / fir timber type on the White Mountain NF? What effects would climate change as predicted by the various models have on the ability to meet regeneration goals for the project? How would increasing temperatures combine with increased sunlight reaching the forest floor to affect soil health and water temperatures in area streams and water bodies of all sizes? What effects would warmer winters and a greater likelihood of ice (as opposed to snow) storms have on potential regeneration success? Could the increased chance of damage to trees at the edges of clearcuts and group selection cuts cause a reconsideration of even-aged harvest techniques? These and similar questions should be considered so that the additive effect of climate change and all other reasonably foreseeable future actions are analyzed and disclosed."

Comment: "What will future forest-growing conditions be like? Which species will be favored at different elevations and in different locations? How will logging affect or alter community composition?"

Comment: "The Kilkenny Roadless Area is part of a vital ecological link for wildlife and plants moving from the Presidential Range and points south, and extensive, remote forestland to the north, east, and west. This type of linkage will become even more critical with climate change."

Response: Overall we agree with the NERA report: "the most effective approach for coping with change will be to anticipate the likely effects of that change and initiate adaptation strategies." That reflects the best available science (for example, Millar et al. 2007). The Mill Brook Project emphasizes creating healthy, resilient ecosystems, as described in Section 3.11 of the EA (environmental effects to vegetation), which will facilitate adaptation.

Information pertaining to the effects of climate change on community composition is provided by Iverson et al. (2007) and Shugart et al. (2003: 13, 21). Iverson, Prasad and Matthews, authors of the Northeast Climate Impacts Assessment research on potential tree habitat, are contributors to the *Climate Change Tree Atlas*, where one may get a sense of what may happen to individual tree species. Their work generally agrees with Case Study 4 in the NERA report (New England Regional Assessment 2001). In general, spruce-fir habitat is expected to decline and oak-hickory and oak-pine habitat to increase in future decades (Iverson et al. 2007: 2, 9, 13, 15-16). Iverson et al. (2007:17) do provide one important caveat, namely that they model suitable habitat, and not species range. "We would not expect the changes presented here to be realized by 2100 unless the disturbance agents cited exert a profound acceleration effect on the changes. We would expect that it is more likely that disturbance agents would hasten declines to a greater degree than they would accelerate the prominence of new species entering the region." We are confident that, through the emphasis on forest health, the proposed actions improve the chance of retaining desired species. See the Purpose and Need (Section 1.1) and the Environmental Consequences (Vegetation/Timber Resources Section 3.11) for discussion on forest health and the effects of timber harvest). Ongoing research projects in the White Mountain National Forest by the University of Vermont, the University of Massachusetts, the University of New Brunswick, and the USFS Northern Research Station are investigating various aspects of climate change. These studies relate to climate change effects on timberline and alpine species, environmental change on genetic variation in tree species to help predict climate change, and a carbon budget of the Forest.

We expect that we will be successful in regenerating the treated stands. The time scale for regeneration is shorter than the time scale over which species distributions change in response to climate (5-10 years, vs. the 90-year endpoint of the tree distribution models; Shugart et al. 2003: 9). Regeneration data from stocking surveys of timber harvests in the Hickey Brook and West Branch timber sales of the late 1990s indicates that we can establish the desired species, after which they will be relatively resilient to longer-term trends, especially if stands are maintained and insect and disease outbreaks are treated. The research of which we are aware (Rhoads et al. 2002; Millward and Kraft 2004; Takahashi Arii and Lechowicz 2007) indicates that the ice storm of 1998 did not greatly alter species composition or tree diversity, although over the long term beech might increase in proportion to sugar maple. Although there might be slightly greater damage along roads (and by inference, harvest unit boundaries), canopy damage did not decrease with distance from the edge. However, monitoring of regeneration as required by NFMA, at the project and Plan level, would certainly lead to reconsideration of harvest techniques if climate-related (e.g. increased ice storm

frequency) influences are detected. Similarly, we are not aware of research specifically modeling soil health or water body temperatures in response climate change and timber harvest but we currently have research being conducted on the Forest by the University of Delaware addressing soil temperature and plants. Riparian guidelines in the Forest Plan are designed to preclude undesirable changes resulting from timber harvest, as discussed in the Fish and Aquatic Habitat (Section 3.3) and Water Resource (3.12) sections of the EA. Following Forest Plan guidance should ensure resiliency of streams and wetlands.

The potential for change at the regional scale is not yet well-understood. For instance, in relation to climate, the *IPCC Working Group II Fourth Assessment Report*, Chapter 14 points out that regional modeling is still an uncertain science:

> *Projections of climate changes still have important uncertainties; especially on a regional scale (Christensen et al., 2007: Section 11.5.3). For North America, the greater uncertainty about future precipitation than about future temperature substantially expands the uncertainty of a broad range of impacts on ecosystems (see Section 14.4.2), hydrology and water resources (see Sections 14.4.1, 14.4.7), and on industries (see Sections 14.4.6, 14.4.7).*

These regional uncertainties must be better understood, as background for making projections at the project scale. Until that time and until interactions with local conditions such as topography and soils receive more scientific attention, additional project-level analysis will not be useful. Recent regeneration experience, coupled with science-based actions oriented toward resistance, response and resilience, is the best predictor of outcomes.

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Appendix E: Glossary and Acronyms

Advance Regeneration: Seedlings or saplings that develop or are present in the understory.

Basal Area (BA): The area of the cross section of a tree a 4.5 feet above the ground, generally expressed as total Basal Area per acre. Under uneven-aged management, usually 30 to 40 percent of the basal area is removed. Under even-aged management, 30 to 100 percent of the basal area is removed depending upon the needed silvicultural treatment.

Board Foot: A measure of lumber volume for sawtimber. The cubic equivalent of a piece of lumber 12 inches wide, 12 inches long and 1 inch thick. MBF is the measure for 1000 board feet.

Cord: A measure of volume for pulpwood and millwood. One cord equals one stack of wood measuring 4 by 4 by 8 feet or the equivalent of 500 board feet.

Crop Tree: Any tree selected to become a component of a future commercial harvest.

Ecological Land Type (ELT): An area of land 100s 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.

Even-aged Management: A timber management system that results in the creation of stands where trees of essentially the same age grow together. Harvest methods producing even-aged stands are clearcut, thinning shelterwood, and seed tree.

Clearcutting: removal in a single harvest of the entire stand to prepare the area for rapid seed germination and growth of a new even-aged stand of shade intolerant trees. Shade intolerant trees are tree species that need full or near full sunlight to regenerate and grow. Clearcuts are 10 acres or larger; smaller clearcuts are called Patch clearcuts.

Salvage Cut: Trees are harvested after some natural disturbance in order to salvage potential wood products before the trees become less valuable or unmerchantable. Depending on the severity of damage, the harvest may consist of harvest of individual trees or of groups of trees. In severe cases, all trees in a stand may be removed to begin a new stand. Disturbances include but are not limited to wind, ice storms, fire, insect infestations and disease.

Seed Tree: A harvest that leaves five or so dominant trees per acre as a seed source for the regenerating stand. A seed tree harvest appears similar to current clearcut units in that both prescriptions leave individual trees standing per acre in a unit to meet silvicultural or other resource objectives.

Shelterwood: This harvest method provides a source of seed and shade protection for regeneration. The original stand is removed down to a prescribed basal area, in two or more successive harvests. The first harvest is ordinarily the seed cutting (sometimes called the regeneration cut). A second harvest often follows a number of years later once regeneration is well established, and is referred to as a final harvest or shelterwood removal harvest. An even-aged stand results.

Thinning: Thinning operations where the harvested material can be sold on the market as opposed to pre-commercial thinning.

Overstory Removal: Mature trees are removed to release regeneration once it has become established, for example in a shelterwood final harvest.

Patch Clearcut: A term used to describe a cutting system used in even-aged management. It defines a clearcut 2 to 10 acres in size. Cleared openings smaller than 2 acres are created in group selection harvests, which is an uneven-aged management approach.

Forest Product: Sawtimber, millwood, pulpwood, and chipwood are the raw products utilized from a tree in a minimum piece length of 8 feet.

Sawtimber minimum piece specification requires a minimum diameter outside bark of 9.0 inches for softwood and 11.0 inches for hardwood and 40 percent sound wood.

Pulpwood minimum piece specification requires a minimum diameter outside bark of 5.0 inches and 50 percent sound and reasonably straight.

Forest Road: Roads needed for long-term management needs or public access which may be opened year-round or intermittently as needed.

Habitat Management Unit (HMU): A large unit of land with boundaries commensurate with compartment boundaries, and which includes a mix of habitat types. At least one of these types must be a pond or stream with wetland potential.

Habitat Type: A small unit of land from a few to over 100 acres lying in a given climatic mineralogical zone and supporting a distinct successional sequence of vegetation growing on a unique type of soil material.

Inholding: A parcel of private land surrounded by national forest.

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.

MBF (Thousand Board Feet): A measure of one thousand board feet of wood fiber volume either in log form or after conversion into lumber.

MMBF (Million Board Feet): A measure of one million board feet of wood fiber volume either in log form or after conversion into lumber.

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.

Management Indicator Species: A plant or animal species adapted to a particular kind of environment. The arrangement of habitats (by tree species and age group) reflects requirements for selected wildlife species. They are designated a management indicator species. Their presence is sufficient indication that specific habitat conditions

are also present. These species represent groups of other species with similar habitat requirements.

Permanent 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 the Forest Plan.

Poletimber: A tree of a size (5″-9″ in diameter) between a sapling and a mature tree.

Prescription: a planned series of treatments designed to change current stand structure to one that meets management goals.

Projected Existing Condition of Habitat Management Unit: The existing acres of the community type by age class would change over time. The expected changes are projected to a future year that becomes the existing condition for that community type by age class.

Riparian Management Zone: A term used by the Forest Service which includes stream channels, lakes, adjacent riparian ecosystems, flood plains, and wetlands.

Road restoration maintenance: rebuilding a road to the standard originally constructed. For example, replacing temporary drainage structures, temporary removal of waterbars or other drainage features to allow for traffic, clearing vegetation that obstructs visibility and smoothing and grading road surfaces.

Road construction: building new road.

Temporary road: a low standard road constructed for a single entry with a minimum of disturbance and that is waterbarred and closed following use.

Sapling: A young tree larger than a seedling and smaller than a pole.

Sawtimber: Trees suitable for in size and quality for producing logs that can be processed into dimension lumber.

Scenery Management System: Refers to the acceptable degree of alteration of the characteristic landscape:

> **Very High (Unaltered):** the valued landscape character "is intact" with only minute if any deviations.
>
> **High (Appears Unaltered):** 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):** the valued landscape character "appears slightly altered". Noticeable deviations must remain visually subordinate to the landscape character being viewed.
>
> **Low (Moderately Altered):** 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 from outside the landscape being viewed.

Very Low (Heavily Altered): the valued landscape character "appears heavily altered". Deviations may strongly dominate the valued landscape character. Deviations must be shaped and blended with the natural terrain so that elements such as unnatural edges, roads, landing and structures do not dominate the composition.

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. (Flatebo, et al. 1999)

Silviculture: A combination of actions whereby Forests are tended, harvested, and replaced.

Stand (Forest): 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. A Hardwood Stand is defined as a stand which at least 75 percent of the overstory and understory are hardwood trees. A Softwood Stand is defined as a stand which at least 65 percent of the overstory and understory is softwood (conifer) trees. A Mixed wood Stand is defined as a stand with hardwoods trees mixed with softwoods trees. The 25 to 65 percent of this stand consists of red spruce, balsam fir, and eastern hemlock.

Streams: Non-perennial and perennial are two types of stream that the quantity of water can be measured.

Intermittent Streams: Streams with a defined channel that the quantity of flowing water can be measured except during the dry summer months.

Perennial Streams: Streams with a defined channel that the quantity of flowing water can be measured year round.

Unauthorized Road: those which exist on the ground but are not currently Forest Roads. Previously referred to as unclassified 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 diameter or age classes to provide a sustained yield of forest products. Harvesting is usually regulated by specifying the number or proportion of trees of particular sizes to retain in each area, thereby maintaining a planned distribution of size classes. Harvest methods that develop and maintain uneven-aged stands are individual selection, improvement, and group selection, and salvage.

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).

Improvement Cut: An interim step to developing an uneven-aged stand structure by removing lower quality stems, leaving a residual basal area of about 65-70 sq.ft. (hardwood) or 80 to 100 sq.ft. (mixedwood) per acre.

Group Selection: A harvest 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 forest stand.

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 for forest products (sawtimber, pulpwood, and chipwood).

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.

Acronyms

AQRV	**Air Quality Related Value**
BE	**Biological Evaluation**
BMP	**Best Management Practice**
CEA	**Cumulative Effects Area**
DBH	**Diameter at Breast Height**
DEIS	**Draft Environmental Impact Statement**
DES	**Division of Environmental Services (New Hampshire)**
DFC	**Desired Future Condition**
EIS	**Environmental Impact Statement**
EJ	**Environmental Justice**
ELT	**Ecological Land Type**
EPA	**Environmental Protection Agency**
ESA	**Endangered Species Act**
FEIS	**Final Environmental Impact Statement**
FOFEM	**First Order Fire Effects Model**
FR	**Forest Road**
FS	**Forest Service**
FSH	**Forest Service Handbook**
FSM	**Forest Service Manual**
FY	**Fiscal Year**
GIS	**Geographic Information System**
HMU	**Habitat Management Unit**
IDT	**Interdisciplinary Team**
LAU	**Lynx Analysis Unit**

LCAS	**Lynx Conservation and Strategy**
LRMP	**Land and Resource Management Plan ("Forest Plan")**
MA	**Management Area**
MBF	**Thousand Board Feet**
ME	**Maine**
MIS	**Management Indicator Species**
MMBF	**Million Board Feet**
MUSYA	**Multiple Use Sustained Yield Act**
NAAQS	**National Ambient Air Quality Standards**
NEPA	**National Environmental Policy Act**
NFMA	**National Forest Management Act**
NH	**New Hampshire**
NNIS	**Non-Native Invasive Species**
ORV	**Outstandingly Remarkable Value**
PWO	**Permanent Wildlife Opening**
RACR	**Roadless Area Conservation Rule**
RARE	**Roadless Area Review and Evaluation**
RFSS	**Regional Forester Sensitive Species**
ROD	**Record of Decision**
ROS	**Recreation Opportunity Spectrum**
S&G	**Standards and Guidelines**
SHPO	**State Historic Preservation Office**
SMS	**Scenery Management System**
SPNHF	**Society for the Protection of New Hampshire Forests**
SVE	**Species Viability Evaluation**
TEP&S	**Threatened, Endangered, Proposed, and Sensitive**
TES	**Threatened, Endangered, and Sensitive**
USDA	**United States Department of Agriculture**
USFS	**United States Forest Service**
USFWS	**USDI Fish and Wildlife Service**
VQO	**Visual Quality Objective**
WMNF	**White Mountain National Forest**
WNS	**White-Nose Syndrome**
WSR	**Wild and Scenic River**