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Forest  
Service

February 2005



# ***SUGARHOUSE PROJECT***

**Towns of Bethlehem and Franconia  
Grafton County, New Hampshire**

## **Environmental Assessment**

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## Sugarhouse Vegetation Management Project Environmental Analysis Summary

The Ammonoosuc-Pemigewasset Ranger District of the White Mountain National Forest is proposing the following management activities for the Sugarhouse Project (Alternative 2):

- Timber harvest of 3.9 million board feet on approximately 873 stand acres of National Forest land within Habitat Management Units (HMU) 112 and 113, utilizing both even-aged and uneven-aged management techniques;
- Perform restoration maintenance on approximately 3.0 miles of existing Forest Service roads (Forest Roads 180, 181 and 182), and re-establish 8 log landings and;
- Perform permanent wildlife opening maintenance to maintain openings in a brushy condition.

The **Analysis Area** for the Sugarhouse Project is HMUs 112 and 113 and encompasses approximately 10,000 acres of National Forest land. Of this, approximately 8,407 acres are within Management Areas 2.1 and 2.1 and 3.1 which prescribes vegetation management to achieve the goals and objectives of the White Mountain National Forest Land and Resource Management Plan (LRMP, 1986). The **Project Area** is the portion of the Analysis Area that includes stands proposed for vegetative management, as well as the area associated with connected actions (roads and landings). The 873 stand acres of National Forest lands proposed for harvest are located in the Towns of Bethlehem and Franconia, Grafton County, New Hampshire, on the Ammonoosuc-Pemigewasset Ranger District of the White Mountain National Forest.

An Interdisciplinary Team (IDT) of Forest Service resource specialists chose the initial treatment areas as a result of an analysis of the existing habitat conditions within HMU 112 and 113 (**Purpose for the action**). Comparing the existing conditions to the desired conditions outlined in the Forest Plan, the IDT identified a need to increase age class and habitat diversity, enhance softwood production on appropriate sites, improve stand conditions for optimum tree growth, and provide quality wood products (**Need for the action**).

In addition to the Proposed Action (Alternative 2) described above, the IDT considered alternative proposals for addressing the Purpose and Need for this project. Two of these alternatives were developed and analyzed in detail, including Alternative 1, the “No Action” alternative and Alternative 3, an alternative that proposes a smaller number of acres for harvest. The proposed activities for each of these alternatives are summarized in Table A and a more detailed description and analysis of effects for each alternative is included in Chapters 2 and 3 of this EA.

**Table A. Activities Proposed for Sugarhouse Project, By Alternative**

Activity	Alternative 1		Alternative 2		Alternative 3	
	Stand Acres	Treatment Acres	Stand Acres	Treatment Acres	Stand Acres	Treatment Acres
Clearcutting	26	0	26	26	26	26
Overstory Removal	58	0	58	44	58	44
Single-Tree Selection	194	0	194	194	194	194
Group Selection	244	0	244	63	114	28
Single Tree and Group Selection Combined	320	0	320	249 STS 71 GS	310	241 STS 69 GS
Improvement Cut	31	0	31	31	31	31
<b>TOTALS</b>	873	0	873	678	733	633

**The Proposed Action (Alternative 2) is the preferred alternative of the Forest Service.** It would meet the Purpose and Need for this project while adequately addressing issues raised by the public and interdisciplinary team (IDT).

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## CHAPTER ONE – INTRODUCTION

### 1.0 Introduction and Document Structure

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

- **Purpose and Need for Action:** The section includes information on the history of the project proposal, the purpose of and need for action, and the agency’s proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.
- **Comparison of Alternatives, including the Proposed Action:** This section provides a more detailed description of the agency’s proposed action as well as alternative methods for achieving the stated purpose. These alternatives were developed based on issues raised by the public, the Forest Service and other agencies. This discussion also includes possible mitigation measures. Finally, this section provides a summary table of the environmental consequences associated with each alternative.
- **Environmental Consequences:** This section describes the environmental effects of implementing the proposed action and other alternatives and is organized by resource area. Within each section, the affected environment is first described, followed by the effects of the No Action Alternative (provides a baseline for evaluation and comparison of the other alternatives that follow) and then the effects of the proposed alternatives.
- **Agencies and Persons Consulted:** This section provides a list of preparers and agencies consulted during the development of the environmental assessment.
- **Appendices:** The appendices provide more detailed information to support the analyses presented in the environmental assessment.

Additional documentation, including more detailed analyses of project-area resources, may be found in the Project Planning Record located at the Ammonoosuc-Pemigewasset Ranger District Office in Gorham, New Hampshire.

### 1.1 Background

The Project Area is located within the Towns of Bethlehem and Franconia in Grafton County, New Hampshire, on the Ammonoosuc-Pemigewasset District of the White Mountain National Forest (Appendix A, Map 1A). It has a history of vegetation and wildlife habitat management dating back to the late 1800’s and continues to be actively managed today. Aside from timber harvest, the area offers a wide variety of recreation activities, including hiking, scenic and fall

foliage viewing, camping, cross-country skiing, snowmobiling, mountain biking, snow-shoeing, wildlife watching, hunting, fishing, and cutting Christmas trees and firewood.

The Analysis Area is the larger National Forest management unit within which the Project Area is found. It consists of “Habitat Management Units” (HMU) 112 and 113, and is approximately 10,000 acres in size. A Habitat Management Unit is described in detail in Appendix B of the 1986 White Mountain National Forest Land and Resource Management Plan (hereafter referred to as the Forest Plan).

### **1.1.1 White Mountain Land and Resource Management Plan – Final Environmental Impact Statement and Record of Decision, as Amended (USDA, 1986, FEIS)**

Management direction for the White Mountain National Forest (WMNF) is established in the White Mountain National Forest Land and Resource Management Plan (LRMP, 1986), the Final Environmental Impact Statement (FEIS) and Record of Decision, as Amended (USDA, 1986 FEIS). The purpose of the LRMP (or Forest Plan) is to provide direction for multiple use management and sustained yield of goods and services from the National Forest lands in an environmentally sound manner.

## **1.2 Purpose for the Action**

The Purpose for this project is to accomplish resource objectives to meet the overall management direction for the White Mountain National Forest, as established in the Forest Plan (USDA 1986a. Forest Plan, III 30-41). Within the Project Area, the Forest Plan establishes the following goals for Management Area 2.1 and 2.1 and 3.1:

The goals for 2.1 are to:

- Protect and enhance visual quality,
- Broaden the range of recreational options, mainly those offering roaded natural opportunities,
- Provide moderate amounts of high quality hardwood sawtimber and other timber products on a sustained yield basis, and
- Provide a balanced mix of habitats for all wildlife species.

The goals for 3.1 are to:

- Provide large volumes of high quality hardwood sawtimber on a sustained yield basis and other timber products through intensive timber management practices,
- Increase wildlife habitat diversity for the full range of wildlife species with emphasis on early-successional species,
- Grow small diameter trees for fiber production and;
- Broaden the range of recreation options, mainly offering semi-primitive motorized experience opportunities.

### **1.3 Need for the Action**

An Interdisciplinary Team (IDT) of Forest Service resource specialists chose the initial treatment areas because an analysis of HMUs 112 and 113, comparing existing habitat conditions to desired conditions as outlined in the Forest Plan, indicated there is a Need to increase age class and habitat diversity (Forest Plan, VII-B-12/13), enhance softwood and hardwood production on appropriate sites, improve stand conditions for optimum tree growth and provide quality wood products.

The Forest Plan allotted the 10,000 acres of National Forest (NF) lands within HMUs 112 and 113 to particular Management Areas, based on a series of factors, such as soils, elevation, community types, accessibility, etc. Lands allotted to MA 2.1 and 3.1, lands where timber harvest is permitted, comprise 8,407 acres, accounting for 84% of the NF lands in the Analysis Area.

#### **1.2.1 and 3.1 Need for Change**

The Forest Plan establishes a “Desired Future Condition” (DFC) for each Habitat Management Unit (HMU). The need for change within a particular HMU is determined by comparing the DFC with the existing ground condition (EC). For MA 2.1 and 2.1 and 3.1 lands within HMUs 112 and 113, the Interdisciplinary Team identified the existing conditions, and then compared them to the DFC to determine where change was needed.

A look at HMU Tables show that, in order to meet the habitat and stand structure objectives of the Forest Plan for HMUs 112 and 113, there is a need to establish regenerating stands of paper birch and northern hardwoods; and to release spruce-fir from the understory of other stands. Commercial timber harvest can be used to achieve these objectives. Even-aged harvest methods can be used to convert mature and overmature northern hardwoods and paper birch stands to a younger, regenerating age class. Uneven-aged harvest methods can be used to increase the acres of spruce-fir by removing the overstory trees where spruce-fir is in the understory.

Economically, harvesting mature and overmature trees would provide high quality sawtimber to area mills and revenue to local communities. At the same time, lower quality or damaged trees can be harvested to improve future stand quality and productivity.

### **1.4 Proposed Action**

The Ammonoosuc-Pemigewasset Ranger District proposes to address the Purpose and Need for Action in HMUs 112 and 113 by applying silvicultural practices to diversify age class and wildlife habitat, improve future stand quality, enhance growing condition for softwoods and provide quality sawtimber.

The Proposed Action would establish 26 acres of early-successional habitat by clearcut in mature and overmature stands of northern hardwoods and aspen-paper birch. It would also treat an

additional 44 acres with an overstory removal to open up the established understory vegetation. It would harvest 608 acres using the uneven-aged methods of single tree and small group selection cuts to promote in-stand growth and release small patches of softwoods like spruce-fir and hemlock. The Project Area totals approximately 873 stand acres (Appendix A).

To access the harvest areas, approximately 3.0 miles of existing roads (Forest Roads 180, 181 and 182) and 8 landings would be restored. Roads receiving restoration maintenance are classified Forest Service roads that have been closed to vehicle traffic since their prior use and stabilized with erosion control devices such as water bars. Restoration includes removing water bars, sod and brush from the road bed; cleaning ditches; replacing culverts and stream crossings; and placing and maintaining surfacing. Restored roads would be closed and stabilized until needed again. All roads within the analysis area will maintain their current classification and no changes will be made to the current transportation inventory.

### **1.5 Decision Framework**

The purpose for this environmental assessment is to provide the District Ranger, the Deciding Official, with sufficient information and analysis to make an informed decision about the Sugarhouse Project given the purpose and need for the action. The deciding official would make the following decisions:

1. Which of the alternatives would best move the Sugarhouse Project Area toward the DFC outlined in the Forest Plan and the Purpose and Need for Action?
2. 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 an environmental impact statement?
4. Do the mitigation measures for the Proposed Action and its alternatives meet the Forest Plan Standards and Guidelines?

### **1.6 Public Involvement**

On April 28, 2004, a scoping letter soliciting comment on the Proposed Action for the Sugarhouse Project was sent to 280 interested people, local newspapers and various agencies and organizations. This project was also listed in the Quarterly Schedule of Proposed Actions for the White Mountain National Forest which is mailed to over 500 people interested in and/or affected by the White Mountain National Forest management. The scoping letter was also posted on our White Mountain National Forest web page ([www.fs.fed.us/r9/white](http://www.fs.fed.us/r9/white)). An announcement of the

original Proposed Action appeared in the legal notices section of the **Union Leader** on April 30, 2004.

Fifteen (15) responses to the scoping letter were received. These responses have been used to formulate alternatives and mitigation measures. In December 2004, these individuals were mailed the 30-Day Comment Report. In response to the 30-Day Comment Report, four individuals provided letters of support for the project.

### **1.7 Issues Used to Develop Alternatives**

Using comments received from the public and within the agency, the interdisciplinary team (IDT) identified issues that are caused directly or indirectly by implementing the Proposed Action, or can be used to develop site-specific alternatives to meet the Purpose and Need. Appendix C, List of Scoping Comments, lists the issues, concerns and comments raised by the public and the Forest Service responses.

Measurement indicators were developed for each issue and are a means of comparing alternatives. Table 4 in Chapter 2 provides a summary of the characteristics of each alternative, including measurement indicators. One issue raised during the scoping process resulted in the development of an alternative to the Proposed Action.

## CHAPTER TWO – ALTERNATIVES

### 2.0 Formulation of Alternatives

This chapter provides a detailed description of the Proposed Action and alternatives to the Proposed Action. Alternative 1, referred to as the “No Action” alternative, proposes that no vegetative management activities be conducted within the Sugarhouse Project Area at this time. Consideration of a No Action alternative is required by regulations implementing the National Environmental Policy Act (NEPA), and is intended to contrast the effects of no action to the effects of action alternatives. Alternatives 2 and 3 are referred to as “Action Alternatives”, since each of these alternatives proposes some level of vegetative management activities within the Sugarhouse Project Area. Alternative 2 is the “Proposed Action”. This alternative was submitted to the public for comment in April 2004. Alternative 3 incorporates changes resulting from public comment. Each of the Action Alternatives meets the Purpose and Need for Action, although there are differences in the degree to which each alternative moves towards the Desired Future Condition described in the Forest Plan.

The process of designing alternatives to address the Purpose and Need for Action began with a review of existing conditions for HMUs 112 and 113. Compartment vegetative data and records were reviewed to identify stands that could benefit from silvicultural treatment. This data was verified through aerial photographs and field reconnaissance. Site specific concerns related to other resources (such as soil, water, recreation, etc.) were identified and addressed either through mitigation measures or deferring silvicultural treatment where appropriate. Alternative actions were considered for silvicultural treatments, and for contributing towards the Desired Future Condition of the HMUs. From all of these considerations, the Proposed Action was developed and submitted to the public for comment (scoping) in April 2004. Alternative 3 was developed to address issues raised by the public during the scoping process.

The Forest Plan lists specific mitigation measures, called Standards and Guidelines, for controlling or alleviating the environmental effects of timber harvesting and road maintenance. These Standards and Guidelines are required when conducting these activities on the White Mountain National Forest, and they are incorporated into this project by reference. Additional mitigation measures have been developed to address concerns specific to the Proposed Action and Alternative 3. These site-specific measures, described in Appendix D, are intended to mitigate specific resource effects. They have been developed either as a result of ongoing research or as a result of monitoring and evaluation of past similar actions on the White Mountain National Forest and elsewhere.

### 2.1 Description of Alternatives

#### 2.1.1 Alternative 1: No Action Alternative

While this alternative does not meet the Purpose and Need for Action, it does provide a basis for analyzing the effects of conducting no vegetative management activities (No Action) in the Project Area, and comparing these effects with those alternatives that propose some level of vegetative management. This alternative is required by regulations implementing the National Environmental Policy Act (NEPA). This alternative would not harvest any trees or conduct any road maintenance. This alternative would not meet Forest Plan expectations for sustained timber products and diverse wildlife habitat in HMUs 112 and 113 for the foreseeable future.

There would be no change to the existing condition of the area except from natural occurrences, ongoing recreation activities, and road and trail maintenance. This alternative provides a foundation for describing and comparing the magnitude of environmental changes associated with the Action Alternatives against those that occur naturally or during routine operations. This alternative responds to those who want no timber harvesting or active wildlife habitat management to take place. Choosing this alternative would not preclude proposing timber harvest in this area at a later date.

**2.1.2 Alternative 2: Proposed Action**

The Proposed Action was developed to meet the Purpose and Need for Action with the most current information available at that time. It would involve harvesting approximately 873 stand acres by a combination of even-aged and uneven-aged management methods (Table 2). This alternative would provide approximately 3.9 million board feet of sawtimber and pulpwood, and improve future stand quality and productivity. Alternative 2 is displayed in Map 2 in Appendix A.

This alternative responds to the need to create uneven-aged stands in hardwood, softwood, and mixedwood community types by creating a mixture of tree ages, size classes and species composition. Using clearcutting and seed tree cuts to help accomplish the desired wildlife habitat composition (Table 5), this alternative responds to the need to create early-successional habitat within these HMUs by converting mature northern hardwoods, aspen and paper birch stands to the 1-10 year old age class, and expanding existing wildlife openings. **It is the preferred alternative of the Forest Service.**

**Table 2. Alternative 2: Proposed Treatments and Acreage**

Activity	Alternative 1		Alternative 2		Alternative 3	
	Stand Acres	Treatment Acres	Stand Acres	Treatment Acres	Stand Acres	Treatment Acres
Clearcutting	26	0	26	26	26	26
Overstory Removal	58	0	58	44	58	44
Single-Tree Selection	194	0	194	194	194	194
Group Selection	244	0	244	63	114	28
Single Tree and Group Selection Combined	320	0	320	249 STS 71 GS	310	241 STS 69 GS
Improvement Cut	31	0	31	31	31	31
<b>TOTALS</b>	873	0	873	678	733	633

The operating season for each stand was based on field visits to evaluate roads, site moisture conditions and ecological land types (ELTs). During harvest operations, trees would either be processed in the woods or at the landing site. Tops of trees processed in the woods would remain on the ground and the tops of trees processed at the landing would be returned to the harvest site and scattered.

**Connected Actions**

Approximately 3.0 miles of existing roads (Forest Roads 180, 181 and 182) and 8 log landings would be restored. Maintenance work entails grading roadways, cleaning ditch lines and culverts, and clearing the road of limbs and hazard trees.

Alternative 2 is the preferred alternative of the Forest Service because it meets the Purpose and Need for Action by improving vigor and growth in some of stands through individual tree harvesting and group selection; helping to meet some of the wildlife habitat composition needs (Table 5) through clearcuts and seed tree cuts; releasing understory vegetation, and enhancing growth and regeneration of softwoods on naturally occurring sites.

**2.1.3 Alternative 3:**

Alternative 3 is a modification of the Proposed Action and prescribes a decreased amount of harvest as a result of public comment. Stand prescriptions for Alternative 3 are displayed on Map 3 in Appendix A. Changes from the Proposed Action are:

**Comparison of Alternatives 2 and 3 harvesting acres in stands 23 and 24**

		ALT 2		ALT 3	
Stand	Prescription	Stand Acres	Treatment Acres	Stand Acres	Treatment Acres
23	Single Tree and Group Selection	130	95 STS 35 GS	130	0
24	Single Tree and Group Selection	10	8 STS 2 GS	10	0

Timber harvesting would occur on approximately 733 stand acres and provide approximately 3.9 million board feet of sawtimber and pulpwood. Harvest operations would also occur only in winter. Site specific mitigations are the same as Alternative 2 and can be found in Appendix D.

**Connected Actions**

The connected actions for road restoration would be the same as Alternative 2.

## 2.3 Comparison of Alternatives –Actions and Outputs

The following tables display characteristics for each of the alternatives. Table 4 is a summary of comparisons for alternatives (including the measurement indicator mentioned in Section 1.7.1).

**Table 4. Summary of Comparison of Alternatives**

MEASURE	Measurement Indicator	ALT 1	ALT 2	ALT 3
<b>PROPOSED HARVEST AREA</b>	<b>Acres</b>	0	873	733
• <b>Clearcut Total</b>	<b>Acres</b>	0	26	26
• <b>Single Tree &amp; Group Selection</b>	<b>Acres</b>	0	789	649
• <b>Overstory Removal</b>	<b>Acres</b>	0	58	58
• <b>Harvest Volume</b>	<b>MBF</b>	0	3.9	3.5
<b>Estimated Stumpage Receipts</b>	<b>\$</b>	0	614,604	549,909
<b>10% Yield Tax Receipts</b> (To Towns of Bethlehem and Franconia)	<b>\$</b>	0	61,460	54,990
<b>25% Fund Payments</b> (To Grafton County)	<b>\$</b>	0	77,936	66,212
<b>Estimated Forest Service Costs</b>	<b>\$</b>	133,760	302,860	285,060
<b>Road Maintenance</b>	<b>Miles</b>	0	3	3

**Summary of Alternatives Table**

Activity	Alternative 1		Alternative 2		Alternative 3	
	Stand Acres	Treatment Acres	Stand Acres	Treatment Acres	Stand Acres	Treatment Acres
Clearcutting	26	0	26	26	26	26
Overstory Removal	58	0	58	44	58	44
Single-Tree Selection	194	0	194	194	194	194
Group Selection	244	0	244	63	114	28
Single Tree and Group Selection Combined	320	0	320	249 STS 71 GS	310	241 STS 69 GS
Improvement Cut	31	0	31	31	31	31
<b>TOTALS</b>	873	0	873	678	733	633

## CHAPTER 3 - AFFECTED ENVIRONMENT & ENVIRONMENTAL CONSEQUENCES

### 3.1 Introduction

This analysis will consider the effects of the project proposal on the following resources: Vegetation; Recreation; Visual Quality Objectives; Roadless/Wilderness Characteristics, Soils (Erosion and Calcium); Water (Quantity & Quality); Fisheries; Wildlife (Habitat, Management Indicator Species, Other Species of Concern, Habitats of Concern); Invasive Plants; Federal Threatened, Endangered, and Proposed Species (TEPS), and Regional Forester Sensitive Species (RFSS); Heritage Resources; and Socio-economics.

Specific issues regarding resources that were raised during the scoping process (see Section 1.7 and Appendix C) are addressed in this chapter. Each resource section is organized as follows:

- Issues Related to the Resource
- Description of Affected Environment (Existing Condition)
- Analysis of Direct and Indirect Effects on the Resource (By Alternative)
  - Direct Effects are caused by the action and occur at the same place and time
  - Indirect Effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.
- Analysis of Cumulative Effects on the Resource (By Alternative)
  - 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.

### 3.2 Vegetation

#### Affected Environment for Vegetation

Major forest community types on the White Mountain National Forest and their silvicultural guides are referenced in Appendix C1 of the Forest Plan. The northern hardwood guide referenced in the Forest Plan is replaced by “A Silvicultural Guide for Northern Hardwood Types in the Northeast”, Northeast Forest Experiment Station Publication NE-603, 1987. The northern hardwood type consists of three subtypes: beech-birch-maple, beech-red maple, and mixedwood (hardwoods mixed with softwoods).

At the landscape level, MA 2.1 and 3.1 lands in HMU 112 and 113, the aspen-birch, spruce-fir, hemlock forest communities do not meet Forest Plan desired conditions. Within the project area and MA 2.1 and 3.1 lands in HMU 112 and 113, there is a predominance of northern hardwood forest at 72% of the total forest composition.

Species content, site factors, and other resource values have been analyzed for each stand to determine if even-aged or uneven-aged management is the most desirable type of silvicultural management. The percentage of forested stands in the two HMU’s designated as even and uneven aged stands are roughly equal at 50% each.

Of the 24 stands being proposed for treatment, two stands with 45 acres are spruce-fir or spruce-hemlock type, two stands are aspen-paper birch at 62 acres, and 20 stands with 766 acres are northern hardwoods. These stands have reached a point where a treatment is recommended based upon the current stand condition, management objectives, Forest Plan standards and guidelines, and the respective Silvicultural Guides. The silvicultural prescriptions contained in the project file describe this in more detail.

### Alternative 1

Under no action, all stands in the Project Area would continue to grow and mature. Some trees would die from natural forces related to size, competition, or age stress. Other similar or more shade-tolerant individuals would replace these trees. Over a long period of time, the stands would begin to resemble a climax vegetation type. This would be a species shift from stands that may contain paper birch, red maple, ash, or aspen to stands dominated by beech, sugar maple, yellow birch, and red spruce. Natural disturbances could modify this outcome by temporarily providing an opportunity for the less, shade-tolerant species such as aspen and paper birch. A modest increase in spruce-fir species content would be expected at higher elevations or on wet soil types. This natural tendency could be offset by mortality in spruce-fir caused by acidic precipitation.

Course woody material would be recruited on the forest floor as trees die. Remaining, healthy trees would grow larger. Larger trees would become more susceptible to ice damage, wind throw, and natural or exotic forest pests. Susceptibility to natural forces over time results in natural disturbances. These may occur in small pockets or over larger areas.

The No Action alternative would have no direct effect such as trampling or compaction on the herbaceous species that currently occupy the sites.

### Alternative 2 - Proposed Action

There are 26 acres of mature aspen, paper birch, and red maple trees that would be regenerated by two stand clearcuts. Species regenerating in clearcut treatments would remain shade intolerant species such as aspen and paper birch. Overstory removal on 44 of 58 acres will replace the existing overstory mature spruce/fir (Stand 5) or northern hardwood (Stand 35) types with young sapling growth of the same species previously created by a shelterwood cuts. The disturbance may encourage regeneration of yellow birch or hemlock. A few species of woody or herbaceous vegetation, with seeds that have a long period of dormancy, such as raspberry and pin cherry, would have an opportunity to germinate and become part of the ecosystem for a period of time. This would increase species diversity.

Stands planned for group selection (63 treatment acres) would have regeneration cuts that are small in size, 1/20 to 1 acre (average 1/2 acre), and are located throughout the stand. These groups would regenerate, on average, 20% of the stand area. Group selection would continue to be practiced in these stands in future management entries. Regeneration would tend toward a broad mix of shade-intolerant, intermediate, and shade-tolerant species. Nearly all the species currently represented in the stored seed mix, or those originating from nearby seed trees, would have an opportunity to germinate and grow in these varied light conditions. There would be some variation in species mix from year to year due to seed periodicity and dispersal. Where advanced regeneration is present as spruce and fir is in the mixed hardwood/softwood stands, it will be strongly represented in the resulting stocking. The amount of ground disturbance can affect species content. Disturbance would favor the establishment of raspberry, paper birch, and yellow birch.

In stands being treated using single-tree selection, a portion of the stand stocking would be cut and removed to stimulate regeneration and to harvest defective or declining and mature trees. Less than 1/3 of the stocking would be removed to create space and light for seeds to germinate and for young trees to grow. Generally, the larger trees would be cut leaving a stand of smaller trees with a dense understory of tree regeneration and other woody plants. Over time residual tree growth and in growth fills in and returns the stand to full stocking. The residual stand restricts sunlight so that the treatment would favor shade-tolerant plants. Over time, there would be a shift in species toward beech, sugar maple, and hemlock. Eventually other species would be eliminated from the population. Single-tree selection allows managers to improve the quality of shade-tolerant growing stock. Beech

trees that are genetically susceptible to beech scale disease or sugar maple trees affected by the sugar maple borer can be harvested and removed from the stocking.

Several of the stands will have a combination of single tree and group selection in the same stands. Of the 320 acres proposed for this type of treatment, 249 acres will be single tree selection and 71 acres will have group selection treatments. The effects will be the same as those listed for single tree selection and group selection treatments.

All but one of the plant species known to occur within the project area are common to northern hardwood communities. Vegetation management would affect herbaceous plant species currently occupying proposed harvest units. Herbaceous plants in adjacent uncut stands would also be affected up to approximately 100 feet from the edge of the units proposed for clearcutting. The effects include changes in environmental gradients (i.e. heat, sunlight reaching the ground floor and moisture, and less competition from intolerant species) created by clearcutting, increased competition from intolerant species, or direct disturbance from harvesting activities. Negative effects tend to be greatest on plant species that are dispersed by animals and least on wind dispersed species. A few species of woody or herbaceous vegetation whose seeds have a long period of dormancy, such as raspberry and pin cherry, would have an opportunity to germinate and become part of the ecosystem for a period of time. These would increase species diversity. These effects are likely to last for 50 years for some species. Within 30-50 years, the understory environment would return to pre-harvest conditions.

One plant species found in the project area that is considered rare in New Hampshire is Squirrel Corn. This plant is listed as Threatened by the NH Natural Heritage Bureau. Squirrel Corn is also on the Regional Foresters Sensitive Species List for the Eastern Region of the US Forest Service. Squirrel Corn is present in two locations in the project area and another area that is outside the project area. Harvesting in the project area would be in the winter and single tree selection would be the prescription. Skid roads would be placed to avoid the specific locations found on the ground.

Uneven-aged management has less impact on herbaceous plant species than even-aged management. Single-tree and group selection harvesting result in fewer changes in environmental gradients. Direct disturbance from harvesting activities would remain about the same as with clearcutting. Many species of woody shrubs and herbaceous vegetation could also become established. The amount of ground disturbance can affect species content. Disturbance would favor the establishment of raspberry, paper birch, and yellow birch.

**Alternative 3 - Modified Proposed Action**

Alternative 3 proposes the same activities from Alternative 2 but eliminates harvesting in areas that were in 2003 roadless rule inventory. Stands 23 (130 acres) and 24 (10 acres) are eliminated from harvesting and to give an alternative to the modified proposed action (alternative 2). Both stands have a combination of single tree selection and groups selection treatments proposed in alternative 2. The 2003 Roadless Rule does not prohibit harvesting of timber in these stands but you cannot build roads in these inventoried areas. The boundary of the 2003 roadless rule area uses an existing snowmobile trail and stands 23 and 24 are located in 2003 roadless rule area.

**Comparison of Alternatives 2 and 3 harvesting acres in stands 23 and 24**

Stand	Prescription	ALT 2		ALT 3	
		Stand Acres	Treatment Acres	Stand Acres	Treatment Acres
23	Single Tree and Group Selection	130	95 STS 35 GS	130	0
24	Single Tree and Group Selection	10	8 STS 2 GS	10	0

One plant species found in the project area that is considered rare in New Hampshire is Squirrel Corn. This plant is listed as Threatened by the NH Natural Heritage Bureau. Squirrel Corn is also on the Regional Foresters Sensitive Species List for the Eastern Region of the US Forest Service. Squirrel Corn is present in two locations in the project area and another area that is outside the project area. Harvesting in the project area would be in the winter and single tree selection would be the prescription. Skid roads would be placed to avoid the specific locations found on the ground. This is the same prescription proposed in Alternative 2 and 3.

## Cumulative Effects on Vegetation

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The Management Area 2.1 and 3.1 Lands in Habitat Management Unit 112 and 113 Cumulative Effects Area is used for vegetative cumulative effects analysis through the end of the decade 2014, so that changes in habitat types resulting from different alternatives can be measured across the HMU and compared with forest plan standards. These are the lands that are allocated to vegetative management in the Forest Plan. Similar treatments to those proposed in the Sugarhouse Project are not anticipated in this area before the end of the decade (2014). The time period covers the past and up coming decades (1994-2014), because forested age classes occur in ten-year increments, and the regenerating age class is 0-9 years old.

The Forest Plan provides goals, objectives, and desired conditions for habitat communities and age classes on MA 2.1 and 3.1 lands within an “ideal” habitat management unit (Forest Plan, pp. III-11 through III- 14, VII-B-3 through VII-B-9). These habitat communities and age classes are determined by the vegetative composition of a stand of trees over time.

There are approximately 8, 407 acres, within the MA/HMU cumulative effects area. There is a lack of regenerating age class in 2.1 and 3.1 lands across the HMU. Clearcutting provides a means of increasing this age class. There are only 83 acres in aspen-paper birch and northern hardwood types that are in the early successional 0-9 year age group.

### Alternative 1

The overall effects would be the same as those discussed under direct/indirect effects but across the cumulative effects area as a whole. There would be no additional harvesting in alternative one. By 2014 there would be no early successional habitat in the HMU unless there were a natural event.

### Alternatives 2-3

Treatments would be applied to compartments 25, 26, 27 to achieve Forest Plan objectives. Both Alternatives 2 and 3 improve the acreage in the regenerating age class in the northern hardwood and aspen-paper birch types by 26 acres.

The increase in the regenerating age class in Alternatives 2 and 3 also results in a slight decrease in the mature age classes. Because the northern hardwood and aspen-paper birch stands available for regeneration are primarily in the mature age class, there is an overall decrease in the mature age class in both action alternatives. Alternative 2 and 3 have a <1% reduction in the mature northern hardwood and paper birch-aspen age class.

Overall, the lands in uneven-aged management and the mature and over-mature age classes on the lands in even-aged management provide a closed-canopy (mature/over-mature) forest. Currently, mature, closed-canopy forest exists on most of the MA/HMU cumulative effects area. Regeneration treatments in Alternatives 2 and 3 would have the effect of reducing the closed-canopy forest in the cumulative effects area. If no natural disturbances create new regeneration, the maximum that closed-canopy forest could be reduced is 1% under Alternative 2.

The cumulative effects on Squirrel Corn using the mitigation measures of winter harvesting, careful skid road design and location, and single tree selection harvesting is expected to minimize loss of Squirrel Corn.

### Distribution of Forest Types by HMU

	HMU	112	HMU	113	Combined	HMU's
Forest Type	Acres	Percent	Acres	Percent	Acres	Percent
Northern Hardwood	3998	77	2079	64	6077	72
Paper Birch-Aspen	914	18	13	<1	927	11
Spruce-Fir	241	5	1120	34	1120	16
Openings	1	<1	36	1	36	<1
Wetlands	0	0	36	1	36	<1
Totals	5,154		3,253		8,407	

### Even and Uneven Aged Management Area Acres in the Project Area

HMU 112	Acres	HMU 113	Acres	Combined Acres
2.1 Even	938	2.1 Even	772	1,710
2.1 Uneven	1,272	2.1 Uneven	944	2,216
3.1 Even	1,975	3.1 Even	618	2,593
3.1 Uneven	938	3.1 Uneven	950	1,888
Totals	5,323		3,444	8,407

Combined Even Aged Acres: 4,303

Combined Uneven Aged Acres: 4,104

### 3.3 Recreation

Recreational opportunity settings for the Sugarhouse Project Area are Semi-Primitive Motorized (MA 2.1, Forest Plan, p.III-30) and Roaded Natural Recreation ROS Classes (MA 3.1, Forest Plan, p.III-36) (Forest Plan, ROS, Appendix H). Today the Project Area receives a moderate amount of recreational use by the visiting public. The various activities in the area experienced by the public are hiking, bicycle riding scenic and fall foliage viewing, cross-country skiing, snowmobiling, snow-shoeing, wildlife watching, and hunting.

#### Trails

There are three trails in or adjacent to the project area. The Franconia Bike Path is a paved bike path that extends from the Flume located at the southern end of Franconia Notch State Park to the trailhead of the Skookumchuck hiking trail located on Route 3 north of the State Park. The Skookumchuck Trail is 4.2 miles long and terminates on the Franconia Ridge Trail. The Franconia Bike Path is used for snowmobiling in winter as part of State Snowmobile Corridor Trail 11. The Franconia Snowmobile Trail's total length is 7.1 miles. Starting at the Skookumchuck Trailhead it proceeds east to the Gale River Loop. The Franconia Trail and the Bike Path is also part of the NH Heritage Trail. A Bike Path extension has been recently proposed that would connect Franconia and

Twin Mountain using either Route 3 or Forest Roads 180, 181, and 182. More preliminary information is needed before this potential Bike Path Extension project is considered for further analysis.

#### Dispersed Camping

Camping is infrequent in the project area. The only road open for public use is State Route 3. There are only one or two places along the road near the project area a vehicle can pull off the road to park. The section of the Skookumchuck Trail within the project area is too near the road to be attractive to backpack campers.

#### Fishing

There are no streams in the project area that are attractive for fishing.

#### Hunting

Large game hunting pressure in the project area is moderate due to periodic entry in the area for timber harvest. Small game hunting pressure is low.

#### 3.3.3.3 Direct and Indirect Effects on Recreation

Semi-primitive motorized and roaded natural opportunities would continue to be provided under all alternatives. For all alternatives, the noise associated with maintaining roads would be evident to any one recreating in this area. Under Alternatives 2 and 3, the noise level will increase due to the harvesting operations. Under all alternatives, the noise level would be acceptable for semi-primitive motorized and roaded natural recreation classes.

No new activities would be implemented at this time under Alternative 1. No direct or indirect effects are anticipated to the hiking, hunting or snowmobiling experiences.

Under Alternatives 2 and 3, there will be evidence of human activity - sounds of equipment, log trucks, and the change in vegetation resulting from timber harvesting.

#### Trails

##### Alternative 2

Snowmobilers will be temporarily relocated to the by pass trail, snowmobile speeds will be reduced in the sale area and snowmobile operators would be required to stop at locations where skid trails cross the trail. Where resource conditions permit, harvesting will occur to minimize the effects on winter recreation activities.

##### Alternative 3

This alternative would have little impacts on both the hiking and snowmobile trail. There would be no hauling on the bike path and skidders would not need to cross the snowmobile trail to access timber. Long term there would be reduced forage for big game species south east of the Skookumchuck Trail and the Bike Path.

#### Hunting

##### Alternative 1

A direct effect of no action is a continued decline in early-successional habitat. Some game species that use this habitat, such as moose, deer, and snowshoe hare, would not find this habitat component within the project area. Indirectly, people interested in hunting these species will probably go elsewhere to find more plentiful game.

##### Alternatives 2

This alternative would create more early successional habitat than alternative 3. This would provide habitat for game species that use this habitat component. Indirectly, people interested in hunting these species would probably find more game in these areas.

### 3.3.2.4 Cumulative Effects on Recreation

In the short term, vegetative management may affect the recreation experience through noise, encounters with logging operations, and alterations to the vegetation (see visual discussion).

Activities that visually alter vegetation may be perceived as either a positive (a vista created by a temporary opening) or negative (an area of stumps and logging slash) effect on recreation experiences. These effects are short term in nature. By ten years after harvesting trees will have grown up enough so that a vista would be lost, and that stumps and slash are covered by vegetation.

Over the past 20 years there have been periodic sales adjacent to Route 3. These sales have created a variety of age classes and maintained species diversity. The selection of either Alternative 2 or 3 will continue the vegetative diversity; however Alternative 2 will provide greater diversity.

## 3.4 Visual Quality Objectives

### Affected Environment for Visual Quality Objectives

The Sugarhouse Project Area is a forested landscape and is typical of management area 2.1 and 3.1 lands. It is dominated by northern hardwood stands with scattered softwood stands. Priest Hill, Bickford and Scarface Mountains provide the primary terrain relief.

There is considerable variety in the forested landscape from previous timber harvesting in both the project and cumulative affects area.

The project area includes two Variety Classes (Forest Plan Appendix I, pp. VII-I-1 and VII-I-2):

- B (Common) - areas where features contain variety, but which tend to be common and are not outstanding by visual quality;
- C (Minimal) - features which have little variety by themselves or in combination

Most of the land within the project area is Variety Class B, Common. A small amount of Class C, Minimal, can also be found in the lower, flatter portions of the project area. All of the project area is located in the Foreground or Middleground zone and is rated Sensitivity Level 1 due to the proximity of sensitive travel routes.

The project area spans lower and mid-mountain slopes ranging in elevation from 1500 to 2400 feet. The landscape is characterized by a large expanse of hardwoods with lesser amounts of evergreens situated primarily along streams and at higher elevations. A variety of textures are visible on the hardwood-dominated slopes resulting largely from harvesting activities that have taken place over the last twenty-five years.

### Viewpoints

The visual quality of the Sugarhouse project is assessed from Route 3 and Interstate 93 which are sensitivity level 1 travel routes. Other travel routes that provide foreground views include the Skookumchuck Hiking Trail, Franconia Notch Bike Path, and a Corridor Snowmobile Trail. Visual quality is also assessed from the Mount Cleveland Wayside Picnic Area that provides foreground views of two proposed units. Artists Bluff provides Middleground views of portions of the project area. Background views were considered from Sugar Hill and Cannon Mountain Ski Area.

The desired condition (DC) within the project area is to meet the Visual Quality Objective (VQO) standards and guidelines as outlined in the Forest Plan and to ensure that any management activities blend into the existing environment.

Forest management and timber harvesting have been common activities in this area since approximately 1900. In order to preserve the visual values associated with the recreation activities in this area, visual effects have been carefully managed by adhering to Forest Plan visual quality guidelines for Management Area 2.1 and 3.1 lands.

Human activity within and around the project area is noticeable. This includes evidence of past timber harvesting activities, roads, and an abandoned railroad grade.

### **Direct and Indirect Effects on Visuals**

Different silvicultural treatments produce different visual effects. The general effects of timber harvesting activities can be found in the Forest Plan FEIS, p. IV-33 and Appendix C, §B.2.4.2. A goal for management area 2.1 lands is to protect and enhance visual quality. For management area 2.1 and 3.1 lands, the desired condition is to have a mosaic of forested stands varying in size, shape, height, and species. Some stands would consist of trees of the same age and height, while others would consist of a mix of sizes and ages ranging from seedlings to very large, mature trees. The choice of harvesting methods is described in the Forest Plan VII-M-8.

Appendix C, §B.2.4.2, provides details of individual stand treatments, VQOs and how each proposed stand treatment meets VQOs.

### **Alternative 1 – No Action**

No harvesting is proposed in this entry under Alternative 1. With this alternative, there would be little or no change in the visual environment from that which currently exists within the project area. Any changes in the existing forested landscape would result from natural causes. As areas harvested during earlier timber 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 or natural occurrences, the vegetation would not include the diversity of tree species, such as paper birch and aspen, as there would be if openings were present.

### **Alternatives 2 and 3**

The visual effects of proposed harvesting vary in relation to the intensity of the harvesting method. The clearcut stands would have the greatest long-term effects while single-tree selection the least. Single-tree selection cuts can affect the visual quality of the landscape by allowing sunlight to penetrate the forest canopy, which allows more visibility at the ground level and improves the growth of the shrub layer.

Slash disposal along roads and trails would mitigate some of the effects of harvesting in these areas, by reducing the height of slash and making stumps less visible. The proposed units have been designed to soften the transition between and avoid abrupt changes in canopy heights and density. In addition, clearcut units would retain two quarter acre reserve groups to break up the open expanse of the treatment unit. These residual trees would also be coordinated with wildlife leave trees into leave-tree islands within openings to help prevent possible blowdowns.

Evidence of harvesting activity would be of irregular size and shape and would be in harmony with the naturally appearing landscape under both alternatives. However, there would be slightly less visual change across the landscape with Alternative 3 than with Alternative 2. The primary difference between alternative 2 and 3 is that single tree selection harvesting would not occur in stands 24 and 25. These two stands have the Skookumchuck Trail in the stands.

Alternative 2 and 3 both meet the VQO for all stands as viewed from the listed viewpoints, travel routes and use areas. The two clearcut units common to both Alternative 2 and 3 are well hidden by topography and are not along a travel route. The size and shape further blends these temporary openings into a textural change as viewed from afar. The single tree selection and the group selection units would create textural changes as viewed from afar but also fully meet the visual quality objective. The two overstory removal units are both along Route 3 but have advanced regeneration present and have either a visual buffer (as in Stand 5) or are below the view of vehicle borne observers (as in Stand 35).

### **Cumulative Effects on Visuals**

The cumulative effects area for the visual analysis is the same seen area as used for the direct/indirect effects. These are the only viewpoints from which the proposed treatments in the Sugarhouse project can be seen. The cumulative effects period is from 1986 to 2020 (ten years from the anticipated completion of activities proposed in the Sugarhouse project).

There have been three timber projects in the cumulative effects area since 1986. The Priest Hill, Skookumchuck, and Bickford Projects are in the cumulative effects area. The majority of the cutting in these sales used uneven aged management using small groups or single tree selection harvesting.

Any visual effects from vegetation harvested more than fifteen years ago would be well recovered, although there would remain some visual evidence from certain viewpoints due to differences in the vegetative texture (older versus younger trees).

Because of the topography, existing vegetation densities in the Foreground Distance Zone, and the low number of viewpoints, this area is able to absorb the cumulative visual changes. This is due to past and proposed vegetative management under Alternatives 2 and 3.

#### **Alternative 1 – No Action**

Because no harvesting is proposed under Alternative 1, there were no direct or indirect visual effects and therefore no cumulative effects.

#### **Alternatives 2 and 3**

Treatments proposed in these alternatives meet the visual quality objectives in the Forest Plan. Some vegetative change will be noticeable along Route 3 and the Skookumchuck Trail.

Because of the topography in the cumulative effects area, existing vegetation densities in the Foreground Distance Zone, and the limited number of viewpoints, this area is well able to absorb the cumulative visual changes due to past and proposed vegetative management under both Alternatives 2 and 3. No additional vegetative treatments are expected or planned in the cumulative effects area through 2020.

### **3.5 Roadless/Wilderness Character**

#### **Affected Environment for Roadless/Wilderness Character**

As part of the Forest Planning process, the White Mountain National Forest is required by law to conduct an inventory of lands within the National Forest that qualify as “roadless”, and then to evaluate and consider these lands for recommendation as potential Wilderness. The following stands fall within the 2003 Roadless Area Inventory: Stand 23 and 24. No stands are in the 2000 Roadless Area Inventory.

#### ***Forest Plan Revision – New Roadless Area Inventory***

For the ongoing Forest Plan Revision, the White Mountain National Forest has completed a new 2003 Roadless Area Inventory. This inventory reconsiders all lands on the National Forest for their Roadless Area potential, accounting for new land acquisitions, changes to the landscape since the last Forest Plan, and improved computer technology for evaluating areas. The new inventory includes 17 Roadless Areas totaling nearly 383,000 acres (excluding 114,000 acres of Wilderness). The new inventory expands the Pemigewasset Roadless Area and a portion of the Sugarhouse Project Area falls within the boundaries of the new Roadless Area, including stands 23 and 24. A map of the new Roadless Area Inventory, including the Pemigewasset Roadless Area, is available in the Project Planning Record.

The nearest congressionally-designated Wilderness Area to the Sugarhouse Project Area is the Pemigewasset Wilderness which is located over 2.5 miles from the nearest proposed harvest unit at the upper edge of stand 23.

#### ***Roadless Characteristics***

Roadless characteristics are quantitative and objective, and they determine whether an area may be considered for recommendation as Wilderness. The Forest Plan Revision Roadless Area Inventory applied roadless criteria to the White Mountain National Forest to determine which areas qualified for consideration for recommendation as Wilderness. Since a portion of the Sugarhouse Project Area falls within the boundaries of the new Pemigewasset Roadless Area, the effects of the project proposal on the roadless characteristics of this area will be analyzed. Not all of the roadless characteristics will be evaluated, since only some of these characteristics are affected by the Sugarhouse project proposal.

The following roadless characteristics will be analyzed:

- To be roadless, an area must have less than a 0.50 mile (½-mile) of improved roads per 1,000 acres of National Forest.
- To be roadless, the percentage of an area that has had a regeneration timber harvest (clear cuts, seed tree cuts and shelterwood cuts) within the past 10 years must be less than 20%.
- To be roadless, an area should have a core of solitude of at least 2,500 contiguous NF acres that is not impacted by motorized influences (and meets primitive or semi-primitive non-motorized recreation opportunity guidelines).

The 2003 Forest Plan Revision Roadless Area Inventory has determined that the Pemigewasset Roadless Area includes 61,914 NF acres, with 12.3 miles of improved roads (a density of 0.20 mile per 1,000 NF acres). **The Analysis Area for direct, indirect and cumulative effects on roadless characteristics** is the Forest Plan Revision Pemigewasset Roadless Area. The analysis considers the existing characteristics of the Pemigewasset Roadless Area and how the proposed project, and any projects in the foreseeable future, may affect these characteristics. Since the Forest Plan Revision will make a determination on future management of the Pemigewasset Roadless Area, the foreseeable future will include any potential activities between now and the implementation of the revised Forest Plan, anticipated to be early in 2005.

### *Wilderness Characteristics*

Once an area has qualified as Roadless, it is evaluated in the Forest Plan Revision process to determine whether it should be recommended to Congress for Wilderness designation. Wilderness characteristics describe those attributes of an area that may or may not make it as a strong physical candidate for Wilderness. Each area is evaluated based on its physical characteristics, the resource trade-offs if it was to become a Wilderness, and demand for additional Wilderness for a particular area. The effects of the project proposal on the Wilderness characteristics of the Pemigewasset Roadless Area will be analyzed. Not all of the Wilderness characteristics will be evaluated, since only some are affected by the Sugarhouse project proposal.

The following Wilderness characteristics will be analyzed:

- Solitude or the degree to which an area provides visitors with a Wilderness experience. Analysis will consider short-term effects and any reduction in the core area of solitude as a result of the project proposal.
- Degree of Disturbance or the degree to which an area's natural appearance may be altered. Analysis will consider the effects of timber harvest and road restoration or construction.

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

### *Consideration for Wilderness*

The Forest Plan Revision process will determine the availability of a Roadless Area for consideration as a potential Wilderness. While the Sugarhouse project may affect Roadless and/or Wilderness characteristics of the Roadless Area, it does not propose any activities that would make the Pemigewasset Roadless Area unavailable for consideration as potential Wilderness in the Forest Plan Revision.

**The Analysis Area for direct, indirect and cumulative effects on Wilderness characteristics** is the same as for roadless characteristics. The time frame for cumulative effects will be the same, as well.

### **3.5.1 Direct and Indirect Effects on Roadless/Wilderness Character**

#### **Alternative 1: No Action Alternative**

Alternative 1 proposes no timber harvest or road restoration or construction, and it would have no effect on the Roadless or Wilderness characteristics of the Analysis Area.

#### **Action Alternatives 2 and 3**

The 1986 Forest Plan permits up to 1,061 acres of regeneration harvest and 353 acres of wildlife openings on MA 2.1 and 3.1 lands within the Analysis Area. To qualify as a Roadless Area, the criteria permit up to 212 acres of regeneration harvest, well beyond the scope of what is permitted by the existing Forest Plan. Within the Analysis Area, Alternative 2 proposes 0 acres of regeneration harvest and 0 acres of new wildlife openings and Alternative 3 proposes 0 acres of regeneration harvest and 0 acres of new wildlife openings. When added to the existing acres of regeneration harvest and wildlife openings identified in the Roadless Area Inventory for the Pemigewasset Roadless Area, the acres proposed in each of the Action Alternatives fall well short of what is permitted by the roadless criteria.

The roadless criteria would permit 31 miles of improved roads in the 61,914 acre Pemigewasset Roadless Area. The inventory identifies 12.3 miles of existing improved roads. Alternatives 2 and 3 propose no additional improved road mileage and hence will remain well below the amount permitted by the roadless criteria.

The Action Alternatives would have limited effect on the roadless characteristics of the Analysis Area, and no effect on its eligibility as a Roadless Area. The Action Alternatives will add to the degree of disturbance in the Analysis Area, but they will not result in an irreversible or irretrievable change in the condition of the land or its capability as potential Wilderness.

### **3.5.2 Cumulative Effects on Roadless/Wilderness Character**

There are no foreseeable projects that would have an effect on the eligibility of the Analysis Area as a Roadless Area nor result in an irreversible or irretrievable change in the condition of the land or its capability as potential Wilderness.

**Summary of Cumulative Effects on Project Area Roadless Area**

<b>Roadless Characteristics</b>	<b>Project Area Roadless Area</b>		
<b>Total Acres</b>	<b>61,914</b>		
<b>Regeneration Acres</b>			
Acres Allowed: to Remain Roadless (20%)	2122		
Acres Allowed: by Current Forest Plan <sup>1</sup>	1061		
Inventoried Regeneration Acres (0-10 yrs)	201		
Acres Added by Sugarhouse Proposal	<b>Alt 1</b>	<b>Alt 2</b>	<b>Alt 3</b>
	0	0	0
Acres Added by Foreseeable Future Actions	0		
<b>Improved Roads</b>			
Miles: Allowed to Remain Roadless	31		
Inventoried Miles (Existing)	12.3		
Miles Added by Sugarhouse Proposal	<b>Alt 1</b>	<b>Alt 2</b>	<b>Alt 3</b>
	0	0	0
Miles Added by Foreseeable Future Actions	0		
<b>Permanent Wildlife Openings</b>			
Acres Allowed by Current Forest Plan <sup>2</sup>	353		
Inventoried Permanent Wildlife Opening Acres	0		
Acres Added by Sugarhouse Proposal	<b>Alt 1</b>	<b>Alt 2</b>	<b>Alt 3</b>
	0	0	0
<sup>1</sup> Equals maximum allowed under current Forest Plan (10% of MA 2.1 and 3.1).			
<sup>2</sup> Equals maximum allowed under current Forest Plan (3% of MA 2.1 and 3.1).			

**3.6 Soils**

**No Unresolved Issues Related to Soils**

**Soil Affected Environment**

The Sugarhouse Project Area has soils common to many other areas across the White Mountain National Forest. It contains deep, well and moderately well drained fine sandy loams on 10-25% slopes. These soils correspond to areas of “suitable” land base where timber management is allowed on the Forest (MA 2.1 and 3.1). The soil erosion risk is high compared to other soils where timber management occurs. Through careful selection of season of harvest, timely application of standards and guidelines, and routine maintenance on permanent roads, soil erosion, based on previous experience in this vicinity, and on similar soils across the Forest, is limited and site specific.

Soil calcium concentration in this vicinity is at the richer end for the White Mountain National Forest. Sugar maple and white ash in the stands reflect this richness. Timber stands previously harvested by even and un-evenaged methods have successfully restocked. Bole-only harvest in the proposed sale retains about 35% of the calcium that would be removed if whole-tree harvest were applied. This sale is part of a harvest program that removes about 1/3

the timber that is biologically available on suitable timber lands, meaning timber sales are generally widely spaced in time and location.

## **Direct and Indirect Effects on Soil**

### ***Alternative 1 – No Action***

Deferring timber sale activity, and its associated skidding and re-opening of roads, will lead to no soil erosion in this heavily forested area. Previously used roads and skid trails are not eroding. Existing trails used for snowmobiles, hiking and mountain biking are well maintained, and show no signs of soil erosion

### ***Alternative 2 – Proposed Action***

Re-opening short spur roads for primarily fall and winter harvest will disturb the soil surface and lead to some re-distribution of mineral soil. Gentle and modest grades, good ditches and properly maintained cross drains would prevent accelerated soil erosion. In addition, winter harvest with frozen ground conditions will also minimize or prevent soil erosion. Log landings would experience soil compaction from repeated truck traffic, and mineral soil would be exposed to erosion hazard. However, flat terrain selected for landings combined, especially, with frozen ground harvest, would limit the likelihood of accelerated soil erosion. Soil compaction at landings and skid trails does not diminish soil oxygen content below that necessary for plant growth, and the soil returns to pre-harvest bulk density within 2-3 years post harvest due primarily to frost action. Potential indirect impacts of soil erosion on water quality are addressed in that section.

Bole-only harvest reduces the impact on soil calcium from timber harvest by returning the calcium rich tops and limbs to the soil. While calcium is removed from the site by timber harvest, direct measurement of exchangeable soil calcium up to 15 years post clear cut, whole tree harvest shows no change in exchangeable soil calcium at the nearby Hubbard Brook Experimental Forest. Long-term re-measurement of forest growth since 1934 at the calcium poor Bartlett Experimental Forest shows no change in biomass accumulation trends in northern hardwood forest. Expansion of this study to a forest-wide basis reveals the same trend. Clear cuts in this vicinity have all adequately restocked within three years following harvest indicating this soil remains productive.

### ***Alternative 3 – Modified Proposed Action***

The soil erosion impacts of this alternative are greater than the No Action Alternative because like Alternative 2 this alternative re-opens roads for fall and winter use, and includes skidding and yarding of logs. However, application of the same standards and guidelines, and fall and winter harvest at most sites, will lead to either no accelerated soil erosion or localized, site specific soil erosion, similar to Alternative 2. The magnitude of soil erosion impact is slightly less than Alternative 2 because fewer acres are accessed by skid trail. Potential indirect impacts on water quality from soil erosion are addressed in that section.

The direct and indirect impact on soil calcium is similar, but slightly less, than Alternative 2. The impact on exchangeable soil calcium, forest growth and forest health are expected to be similar. This alternative does not exclude soils that might respond differently, such as eliminating soils that are shallow to ledge. All soils, in both alternatives, are deep and well or moderately well drained sandy loam tills.

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## ***Cumulative Effects on Soils***

Soil erosion cumulative impacts considered include the Meadow-Brook Middle Tributaries and North Branch Gale River Watersheds because these include road use potentially affected by this sale. The period of analysis is 1994-

2014 to account for past timber sales, and completion of the proposed sale. This is the same analysis area as the water quality analysis.

There is no on-the-ground evidence that past sales or road use has lead to accelerated soil erosion. All skid trails, and landings, are re-vegetated. All clear cuts are adequately re-stocked. The proposed sale does not include any extraordinary circumstances, such as deep soil slump hazard. The Proposed Sale is in accord with all standards and guidelines to minimize soil erosion, including winter harvest for many proposed harvest units. While trail use will continue into the future, all trails are well maintained. No future timber sales are planned for this vicinity. Cumulative soil erosion impacts are localized, site-specific and limited in magnitude.

Soil calcium cumulative impacts include the effects of past harvest, past and future acid deposition, and the proposed harvest. While there is some potential for change in soil buffering capacity, and therefore a reduced ability to buffer acid deposition, direct measurement of exchangeable soil calcium indicates no change after measurement for fifteen years following clear cut, whole tree harvest. Past sales in the Sugar House Project Area were largely heavy harvests treatments, but harvest has been infrequent (not short rotation), little clear cutting is proposed (26 acres), and this site is estimated to be relatively calcium rich compared to much of the White Mountain National Forest. Forest growth trends are expected to follow those measured at the Bartlett Experimental Forest since 1934, where no change in biomass accumulation trends has been found. Atmospheric deposition is the largest factor in potential acidification of soils, compared to relatively small cumulative impacts from forest harvesting.

Greater detail on soil effects analysis on soil erosion and soil calcium may be found in the project file.

### 3.7 Water

#### Water Resource

**There were no significant issues associated with the Water Resource**

#### Affected Environment

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The Sugar House Project is located in the Meadow Brook–Middle Tributaries watershed. This watershed is located in the headwaters of the Gale River and is a 12-digit HUC watershed (010801030302). Its total acreage is approximately 15,120, and it comprises the analysis area for direct and indirect effects on water resources.

The State of New Hampshire designates surface waters in the Meadow Brook-Middle Tributaries watershed as Class B. This classification indicates that these waters are considered acceptable for fishing, swimming, and other recreational purposes and, after adequate treatment, for use as water supplies. Surface waters in the watershed are not currently used for municipal purposes. Littleton and Bethlehem have surface water supplies on the Gale River. However, these surface water sources are upstream of the project area in the North Branch Gale River watershed, and therefore would not be affected by the proposed project. At present, there are no surface waters listed as not meeting water quality standards in the Meadow Brook-Middle Tributaries watershed by the state of New Hampshire.

New Hampshire antidegradation provisions apply to all new and increased point and non-point source discharges of substances, including all hydrologic modifications and all other activities that would lower water quality or affect the existing surface waters of the State. Under these antidegradation provisions, waters of the National Forest are designated as

"Outstanding Resource Waters" (ORW) and shall be maintained and protected (NHDES, 1999). Some limited point and nonpoint source discharges may be allowed, providing that they are of limited activity that results in no more than temporary and short-term changes in water quality.

Historic logging occurred within the Meadow Brook-Middle Tributaries watershed. Trees were logged from riparian areas and woody material was removed from streams. Subsequent flooding and scour added to these effects and resulted in portions of the watersheds with less than potential levels of woody material and loss of diverse channel and floodplain characteristics. A 1903 fire burned much of this area, further contributing to the scour of the channels. Today, increased dead woody material in the streams and live trees on the banks contribute to the protection of stream banks and the creation of habitat for aquatic species.

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### Alternative 1 - No Action

There would be no new direct or indirect effects to water quality, water quantity or related changes to channel stability from implementation of Alternative 1 (No Action). Streams and riparian areas would continue to function much in the same way as present. Forest Plan direction, Standards & Guidelines, and Best Management Practices would continue throughout the project area. Current and on-going management activities would continue, but no new federal management activities would be initiated.

### Alternative 2 and 3 - Action Alternatives

#### Water Quantity

The extent of harvesting in a watershed can affect the water quantity in a stream. If increases in water quantity are great enough there is the potential for these increases to affect the stability of the stream channel. The ability of increased water quantity to affect channel stability is determined both by the amount of water quantity increase and the current stream stability.

The units proposed for timber harvest drain into 2 tributaries of the Gale River, as well as the main branch. These tributaries include Jordan Brook and a perennial tributary north of Jordan Brook. Drainage into the main branch of the Gale River is predominantly in the form of sideslope drainage. The 2 tributaries and the main branch Gale River were delineated into their own subwatersheds for the water quantity analysis.

The measure for changes in water quantity is the percentage (%) of the basal area removed in each delineated subwatershed of the Meadow Brook-Middle Tributaries watershed. These percentages are based on each unit's current basal areas and their predicted post-harvest basal areas. Where less than a 25% reduction in basal area is determined, no measurable increase in discharge is expected in the channel associated with those watersheds.

The basal area reductions in the Meadow Brook-Middle Tributaries watershed did not exceed the 25% threshold for any of the Action Alternatives (Table 1). No measurable increase in discharge is expected in the channels associated with those watersheds. Therefore, no channel adjustment related to increased water quantity from timber removal is expected at this scale.

#### Water Quality

Nitrogen is the primary nutrient affected by vegetation harvest (Stuart and Dunshie, 1976). This makes nitrate a good indicator to detect effects of timber harvest on water chemistry. Monitoring on the WMNF has indicated that changes in nitrogen levels are isolated to the immediate area of treatment and may not even be evident depending on the extent of timber harvest in the watershed (Stuart and Dunshie, 1976 and Hornbeck, et al., 1986). Research shows watersheds treated with methods similar to those proposed in the alternatives did not exceed water quality standards for nitrate (Hornbeck, et al., 1973). In addition, stream water from untreated areas dilutes this effect of increased nitrate and other chemical concentrations.

Because the mitigations would be used regardless of the Action Alternative selected, loss of nutrients and changes in water chemistry and temperature related to the harvest of trees is not expected to deplete nutrient levels in the watersheds or cause water quality standards to be exceeded for either of the Action Alternatives. Water quality is unlikely to vary between alternatives since mitigations would be applied to any selected Action Alternative.

Fine sediment is easily transported suspended in water. Direct effects can occur where roads and skid trails cross stream channels because, at these locations, sediment can be delivered directly into the channel. Indirect effects can occur from sediment transport on skid trails, roads, landings, and disturbed ground from tree dragging.

The magnitude of effects caused by sediment transport is related to area of disturbance. These areas which lack vegetation and have disturbed soils become the source for sediment transport. This area can be measured by acres of ground disturbance resulting from skid trails and landings, miles of new road construction, and miles of pre-haul maintenance on existing roads. Table 2 summarizes these measures for comparison by alternative. Of the Action Alternatives, Alternative 3 disturbs the fewest acres (35.1 acres), and Alternative 2 disturbs the most (41.5 acres).

Should an Action Alternative be selected, pre-haul road maintenance would occur on short stretches of road between Route 3 and the landings. In addition, most of the landings proposed for use in this timber sale are pre-existing. One new landing would be constructed in unit 11. This landing would be constructed for either Action Alternative. Under both Action Alternatives, the only road to be constructed would be the road used to access the new landing in unit 11.

An estimated 9 culverts would be installed along the logging roads at intermittent stream crossings in Alternatives 2 and 3. Although placement of the culverts in the stream channel will initially cause some disturbance, properly sized culverts that are capable of passing bankfull flows can minimize future stream crossing impacts. These culverts would be removed following sale closure. No logging roads in the project area will cross perennial streams.

No perennial streams would be crossed by skid trails. As described in the mitigations section, intermittent stream crossings would be minimized through skid trail layout in order to minimize the potential of sediment reaching a stream channel and to minimize impacts to stream stability. These streams would be crossed through the use of either culverts and poles or bridges.

The most effective factor for preventing sediment and nutrients from reaching a watercourse is a buffer strip (Gilliam, 1994). Trees adjacent to perennial streams will be retained, and trees will be felled directionally away from streambeds, where possible.

Winter harvest is effective at reducing disturbance at smaller stream crossings because activities occur when the channel is frozen or snow-covered. Mitigations such as temporary

stream structures to protect the channel, drainage structures, and sediment control where needed, protect the overall integrity of the stream.

Most effects related to roads reopening and skid trails are short term in duration through the use of the mitigations described above. However, the effect of elevated turbidity during storm events would probably remain as long as bare surfaces remain exposed. Skid road contributions would decrease to near zero as the skid trails revegetated and stabilized after use. Turbidity increases during storms related to permanent roads would probably continue to occur as long as the roads are in place. However, this effect would be mostly the same as what is occurring presently since only 0.1 miles of new road construction is proposed for either Action Alternative. Maintenance and reconstruction of roads in relation to the proposed action would probably contribute to this effect since disturbance and use of the roadbed allows sediment to mobilize and be removed in subsequent rainfall events. However, since the increases in turbidity occurs only during storm events when turbidities are naturally elevated, it is not likely these increases will have an effect on aquatic life, stream morphologies, or overall water quality in the watershed. This effect of sediment transported from the forest road system is currently being monitored through the forest wide water quality monitoring plan that takes annual samples across the forest to track numerous water quality parameters, including turbidity.

Based on the previous discussion, the direct and indirect effects on water quality from the proposed Action Alternatives are anticipated to be small, localized, and temporary. The existing roads, landings, and skid trails provide an example of the condition that these facilities will be in several years following the sale if all the same standards and guidelines are followed as before. Skid trails and landings are vegetated and stable, showing little evidence of sheet or rill erosion. Water quality remains high in the watersheds. In the project area, the proposed Action Alternatives would not violate the Outstanding Resource Waters standards, or the standards of Class B waters, as mitigations outlined in Appendix E and described above in the Mitigations section would be implemented.

## Cumulative Effects on Water Resource

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The cumulative effects area (CEA) for water resources is the Meadow Brook–Middle Tributaries and North Branch Gale River watersheds. The North Branch Gale River watershed is upstream of the Meadow-Brook Middle Tributaries watershed and was considered in the CEA because of its location upstream and subsequent ability to bring pollutants into the Meadow Brook-Middle Tributaries watershed. As water flows downstream, pollutants are mobilized into the watershed, and changes in water yield and chemistry related to the project merge with other waters within the watershed. This scale is large enough to integrate processes within the watersheds and gather the result to a single point at the outlet of the watersheds.

Past and present activities that occur in the cumulative area watersheds include timber sales, recreation including trails, road maintenance and use, and activities on private land such as developments and roads. Future activities include the proposed action, additional activity on private lands, continued recreation use, and ongoing road maintenance and use.

### Water Quantity

Approximately 2% of the Meadow Brook-Middle Tributaries watershed and 2% of the North Branch Gale River watershed was harvested in the past ten years. In general, due to the limited nature of timber treatment practices, time between timber sales, and the use of BMPs, no measurable increases in water quantity are expected to be currently present in the watershed. Additions to water yield as a result of the Sugar House Vegetation Management

Project would not be visible in the CEA. This is because less than 25% of the basal area in the CEA watershed is proposed for removal in all Action Alternatives. The White Mountain National Forest currently has no timber sales planned in the CEA in the next ten years.

In addition, to protect against cumulative effects on water quantity from generation of additional runoff by timber harvest, the Forest Plan includes a standard and guideline that limits the amount of clearcutting in a 1,000-acre or larger watershed to 25% within a ten year period (LRMP p. III-17). None of the Action Alternatives would approach the 25% limit for clearcuts in either the Meadow Brook-Middle Tributaries or North Branch Gale River watersheds, even when combined with previous sales. Alternatives 2 and 3 propose the same level of clearcutting. Selection of either alternative would result in less than 1% of the Meadow Brook-Middle Tributaries watershed being harvested by clearcutting, while no harvesting is proposed in the North Branch Gale River watershed.

Private land constitutes 30% of the cumulative effects area. The extent of clearcutting on private land in the two watersheds is unknown. There is the potential for water quantity increases in the watershed if all of the private land were clearcut. It is, however, unlikely that the private land would be harvested this heavily.

Since no changes in water quantity are anticipated in the CEA, it is also unlikely that changes in channel stability would occur as a result of the Sugar House Timber Sale. It is also unlikely that channel stability will be affected in the next 10 years by changes in water quantity, as no timber harvest is proposed on public land.

## Water Quality

The water chemistry of a stream can be affected by atmospheric inputs as well as forest management practices. Both will be described below.

Atmospheric deposition refers to all pollutants carried by the air and deposited on land and water causing numerous effects, including acid rain. Acid deposition refers to those components in the air that reduce the pH of water. The main pollutants responsible are sulfur and nitrogen oxides primarily from the burning of fossil fuels by electric utilities and motor vehicles. Sulfur and nitrogen react with rainwater through chemical reactions, which lowers the pH of rain thereby increasing acidity. This rainwater reacts with soil, vegetation, and water resulting in changes in chemistry across the ecosystem (Likens and Borman, 1995).

As discussed in the water quantity discussion, the Sugar House Timber Sale does not propose to harvest large portions of watersheds. Research shows that watersheds treated with methods similar to those proposed in the alternatives did not exceed water quality standards for nitrate (Hornbeck, et al., 1973). Because of this, the removal of vegetation proposed in this sale is not expected to worsen the impacts of acid deposition on water quality.

Private lands constitute 30% of the cumulative effects area, all of which is located in the Meadow Brook-Middle Tributaries watershed. At present, water quality and changes to runoff as a result of activities on private land are not causing the river to exceed water quality standards. However, it is possible that future activities on this ownership could contribute to localized pollution effects if managed improperly and developed extensively.

Past, present, and future road activities on the forest are expected to continue in much the same way as present. About 77 miles of classified roads are present in the cumulative effects watersheds. Road density in the watershed is generally low since the roads are spaced throughout a 28,460-acre cumulative effects area, for an average of 14 feet of road per acre. Future road activity on private land is unknown.

Cumulative effects related to past, present, and future recreational activities in the cumulative effects area have not been observed or detected. Recreation use in this watershed is largely limited to roads, trails, and streams. The trails in the riparian area may be contributing to increased sediment loads into streams at localized areas despite mitigations such as water bars.

In summary, there is a low risk of cumulative effects on water quality, water quantity, or the condition of streams, riparian areas, or floodplains, in the cumulative effects area from the Action Alternatives, as these alternatives would create a small amount of new disturbance that would be mitigated as described in this report. The mitigations are expected to be effective based on previous experience on the White Mountain National Forest, but no mitigation is 100% effective. By using multiple mitigations, impacts are reduced to negligible, localized, or easily recoverable.

### 3.8 Air Resources

#### Affected Environment for Air Resources

The proposed Sugar House Vegetative Management Project is located within the White Mountains airshed, which is the body of air which lies over the forest. The project area is located on the south slopes of the predominately east-west trending valley of the Gale River. Regional winds move from west to east. Local winds are dominated by mountain valley dynamics interacting with large-scale atmospheric movements.

Air is regulated in two ways – National Ambient Air Quality Standards (NAAQS) and in relation to Class I areas. Under the Clean Air Act, Class I air quality areas are afforded the highest level of protection from air pollution in the nation. In the White Mountain National Forest, the Class I air quality areas are located in the Presidential Range-Dry River Wilderness and the Great Gulf Wilderness Area. The project area is designated a Class II air quality area, and is about 13 miles away from the nearest Class I air quality area.

#### Mitigation Measures

No additional mitigations are recommended beyond compliance with Forest Service Standards and Guidelines and State Best Management Practices (BMPs).

#### Direct/Indirect Effects on Air Resource

**Table ? – Summary of Direct/Indirect Effects on Air Resource**

<i>Direct/Indirect Effects Area</i>	<i>Estimated Area</i>
Meadow Brook-Middle Tributaries watershed	15,120 acres of private and public lands
<i>Alternative</i>	<i>Summary of Effects</i>
1 – No Action	No new direct or indirect effects. On-going activities would continue.
2 and 3 – Action Alternatives	Effects of heavy equipment, tools, and road maintenance would be localized and short-term and are not expected to cause NAAQS to be exceeded.

The direct/indirect effects airshed includes part of the Gale River valley 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. These airshed boundaries are the same as the 12-digit HUC Meadow Brook-Middle Tributaries watershed boundaries (010801030302). The ridges within this watershed form a boundary to local air pollution effects by blocking movement of pollutants, while the pollutants are transported in the valleys (Figure 1).

**Alternative 1 – No Action**

No activities are proposed and no additional emissions are expected to take place in the project area, beyond what occurs now.

**Alternatives 2 and 3 – Action Alternatives**

The direct effect of timber harvest and road maintenance activities proposed in the Action Alternatives is the emission of NO<sub>x</sub> and particulate matter resulting from the use of heavy equipment, diesel-operated motors, and gas-operated chainsaws and other tools, as well as dust from roads. However, because the limited duration of operation of this emission-generating equipment, and because this equipment will generally be operated in the fall or winter, with the exception of one unit proposed for summer harvest, it is unlikely that the proposed operations would exceed the NAAQS.

**Cumulative Effects on Air Resource**

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**Summary of Cumulative Effects on Air Resource**

<i>Cumulative Effects Area</i>	<i>Temporal Boundaries</i>	<i>Estimated Area</i>
Gale River valley	1994-2014	Approximately 60,000 acres of private and public lands
<i>Alternative</i>	<i>Summary of Effects</i>	
1 –No Action	No new cumulative effects. On-going activities would continue.	
2 and 3 – Action Alternatives	Effects of heavy equipment, tools, road maintenance, and wood burning both on and off Forest Service lands are not expected to cause NAAQS to be exceeded.	

The cumulative effects area (CEA) for air quality includes the Gale River valley, 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. The New Hampshire Department of Environmental Services has reported that there are no stationary sources of air pollution within the cumulative effects area (NHDES, 2004; USEPA, 2004b).

**Alternative 1 – No Action**

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.

**Alternatives 2 and 3 – Action Alternatives**

The Action Alternatives would result in the same emission-producing activities as was discussed in the Direct/Indirect Effects section of this report. None of these emissions are expected to contribute to existing cumulative effects already present in the cumulative effects area.

## 3.9 Fisheries

### Affected Environment for Fisheries

Historic logging practices likely had an adverse effect on instream habitat conditions in New Hampshire (Taylor et al. 1996). Over time, instream habitat has improved and stream inventories conducted across the White Mountain National Forest indicate that most streams have suitable instream habitat required by eastern brook trout (*Salvelinus fontinalis*). However, there continues to be a lack of habitat diversity, with the percentage of pools far lower than recommended guidelines (USDA Forest Service 1996).

**The Analysis Area for direct and indirect effects on fisheries** includes the Project Watersheds described in Section 3.7, Water. Most of the perennial streams in the Analysis Area are first and second order and are located on moderate to moderately-steep slopes. **The Analysis Area for cumulative effects on fisheries**, as well as the temporal scale of 1994 to 2014, is the same as the CEA described in Section 3.7, Water. For the Proposed Action and its alternatives, effects to fisheries are similar to those for water quality and quantity.

Eastern brook trout have been monitored at nine sites across the Forest since 1992. Young of the year were present at all sites in all years, indicating that trout are well distributed across the Forest and producing young. None of the sites showed increasing or decreasing densities over the sampling years. Data was collected on the National Forest from 1992-1999 and a report generated that concluded the data “did not show any evidence that land use activities are influencing fish populations perhaps due to the larger influence of other environmental factors such as floods or mild winters” (USDA Forest Service 1999). This data suggest wild brook trout populations are viable in all the major watersheds of the White Mountain National Forest (USDA Forest Service, 2001).

Past stream inventories recorded presence of brook trout in all first and second order streams in the Analysis Area. Young of the year were observed in some of the streams in the Analysis Area, indicating spawning habitat is present. State of New Hampshire records show that brook trout are stocked in the Ammonoosuc River on an annual basis. Brook trout are the Management Indicator Species for lakes, ponds, and stream habitat on the White Mountain National Forest. Based on this information, it is assumed that brook trout and a variety of other fish species and aquatic invertebrates inhabit the perennial brooks in the Analysis Area.

Important factors for maintaining quality brook trout habitat include cool continuous flowing water, unimpeded travel upstream and downstream, clean gravels for spawning and egg incubation, clear waters during the growing season, instream cover, adequate food supply, high quality headwater streams, and suitable riparian habitat. The desired condition for fisheries resources for all of these streams is to meet Forest Plan Standards and Guidelines for water quality, riparian, fisheries, and aquatic habitat management (Forest Plan III-a-d, -16, -19, -20).

#### 3.9.1 Direct, Indirect and Cumulative Effects on Fisheries

Direct and indirect effects to fish habitat result from sedimentation related to road restoration, stream crossings, skid trails, culvert, tree felling and landings. Increased turbidity in streams during any of these activities is a direct effect that could cause fish and other aquatic life to move temporarily from the area, where possible. Sedimentation is an indirect effect that is described in detail in Section 3.7.2. The mitigation measures (Appendix C) and Forest Plan Standards and Guidelines that would be employed to diminish or eliminate the impacts of sedimentation on water quantity and water quality are the same that would be employed for fisheries. In particular, maintaining 70% crown closure in a 100-foot riparian strip adjacent to perennial streams (as recommended by the Society for the Protection of New Hampshire Forests, 1997), should prevent increased sedimentation to the streams, protect the

soils infiltration capacity, maintain shading to minimize any increases in water temperature, and provide for large woody debris recruitment.

Cumulative effects to fisheries are the same as for water quantity and quality (Section 3.7.3). Maintaining large trees adjacent to streams may improve future instream habitat diversity in these streams by promoting recruitment of large woody debris necessary for pool formation (Likens and Bilby 1982). More habitat diversity provides more refuge during floods, helping to stabilize brook trout populations (USDA Forest Service 2001).

## **3.10 Wildlife**

### **3.10.1 Wildlife Habitat**

#### **Terrestrial Wildlife Environmental Consequences**

##### **Direct and Indirect Effects on Management Indicator (MIS) and Wildlife Resources**

The analysis area for direct and indirect effects included the site-specific Sugarhouse Project Area. Most of the wildlife species expected to occur within the Sugarhouse Project Area can also be found on other parts of the District, across the Forest, and few species could occur on suitable portions of private land (i.e. Town of Franconia) near the Project Area.

In general, any action (including No Action) that affects vegetation has the potential to affect wildlife. The potential direct and indirect effects from vegetation management and use of existing forest road, skid trail and landings could be beneficial for some MIS species, yet neutral or negative for others based on their specific or generalist habitat needs.

This Section summarizes the potential effects to MIS, Other Species of Concern, and TEPS (taken from the Sugarhouse BE). Several MIS occur within the Sugarhouse Project Area and Table 5 discloses a comparison of the potential direct and indirect effects to the amount and quality of habitat available to MIS by alternative.

##### **Alternative 1 - No Action**

Prehaul maintenance of existing forest roads, reuse of skid trails or landings, tree removal, and noise from these activities would not occur in the Sugarhouse Project Area at this time. Routine maintenance of existing roads or fire suppression activities could occur in the area.

##### **Direct Effects**

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

Changes in the existing condition of vegetation community type or age class composition would occur through the natural process of forest succession or large-scale disturbances (fire, hurricane, ice storm, drought, or insect and disease infestations). Alternative 1 would perpetuate a mature and over-mature forested habitat condition, which is suitable to bark gleaners and cavity-dwelling species such as woodpeckers, owls, forest bats and flying squirrels (Tubbs et al. 1987).

The MIS northern goshawk, no nests detected during field reviews of the Project Area (FS & Research Bio reviews), and the MIS Cape May warbler (if present) would benefit from no change in the existing condition of the mature and over-mature, even-aged class of northern hardwoods and spruce/fir respectively. Forest interior species such as the ovenbird and wood thrush would also benefit from the perpetuation of the mature northern hardwood community type. Species preferring mature closed-canopy and climax forest conditions, such as the MIS broad-

winged hawk and the MIS ruffed grouse representative of the mature/over-mature paper birch and aspen community respectively would benefit from the No Action alternative in the short term.

However, analysis of the HMUs 112 & 113 (see Vegetation Report in Project File) indicates a need for creating a mixture of multiple age and size classes of trees in northern hardwood community type to meet the Forest Plan desired condition (DC) for habitat diversity. There is a disproportionate amount of habitat available at the landscape level for species that use regeneration age class, as adjacent private lands do not contribute substantially to this age class diversity. The No Action does not meet the Purpose and Need and would not: move the forest towards the DC for the regeneration age class in the northern hardwood, spruce/fir; nor paper birch community types; nor provide wildlife habitat diversity in managed lands identified in the Forest Plan (USDA-LRMP 1986a, III 30-35, III 35-41); nor meet the DC for HMUs 112 & 113. The opportunity to perpetuate alder or paper birch or aspen components within the Project Area would not occur, and without a catastrophic natural event, these community types would decrease over time.

### **Indirect Effects**

The No Action would cause an adverse indirect effect of a decline in habitat diversity in the early-successional age class and the paper birch /aspen community types over time. The No Action would not provide an opportunity to increase the amount of early-successional (0 to 9 year old regeneration age-class) or next successional young-aged hardwood type, used by various life stages of Neotropical migratory birds (including several MIS). No Action would cause an adverse indirect effect on the MIS mourning warbler, MIS chestnut-sided warbler representative of permanent upland opening community and early-successional and young age class (sapling) in the northern hardwood community type.

The No Action over time has a greater potential for accumulation of downed woody material and large diameter cavity trees compared to the harvest units proposed for the action alternatives. However, Alternative 1 would not provide an opportunity via harvest treatments to increase the paper birch, aspen, or pin cherry components, and perpetuate raspberries. Over time the loss of paper birch or aspen types would cause long-term, adverse indirect effects on MIS broad-winged hawk and MIS ruffed grouse associated with these community types, and cause a potential decline in the diversity of wildlife MIS favoring early-successional habitat, such as white-tailed deer and several neotropical migratory song birds in the Project Area.

There would be a lost opportunity to stimulate hardwood regeneration or increase available browse adjacent to the existing scattered softwood component, as recommended for moose and MIS white-tailed deer habitat management (Reay et al. 1990). Alternative 1 would not increase the amount of softwood spruce/fir regeneration or release softwood regeneration for MIS snowshoe hare.

Indirect effects over time would include declines in habitat diversity, and these MIS and general wildlife species would not find suitable habitat within the Project Area. There would be a potential decline in overall diversity via loss of vegetation age class and type and associated wildlife in the Sugarhouse Project Area (NHFG 1996).

### **Alternative 2 – Proposed Action**

Trees would be removed via 26 ac clearcut; 42 ac overstory removal; 41 ac improvement cut; 194 singletree (@30% basal area); 114 group (1/10<sup>th</sup> to 2 acre with ½ acre average size); 454 ac combined single tree and group selection; 42 overstory removal: All vegetation management totaling approximately 871 treatment acres. Minimal amount of @ 4.0 mles of pre-haul road maintenance would occur along existing Forest Roads 180, 181, 182. The majority of stands are proposed for winter harvest.

### **Direct Effects**

Alternative 2 would cause the direct effect of displacing some wildlife species. In general, the timing of harvest would directly affect species differently. Summer harvesting could affect arboreal and ground dwelling species that use trees for hiding cover, nesting, or foraging habitat. Fall harvesting could affect fewer arboreal or ground dwelling species, but could potentially affect species breeding and foraging on fall mast. Winter harvest potentially affects less ground dwelling species and may affect species using trees for winter dormancy habitat. Generally, species with home ranges larger than the proposed harvesting units could avoid the area during vegetation management activity.

Winter harvest is proposed for the majority of the treatment units. Forest-wide S&Gs would maintain 1.25 to 2.50 sq. ft/acre of trees with an 18-inch dbh at breast height as existing and future wildlife trees within the proposed harvest units (USDA-LRMP 1986a, III-15, VII-B-21, S&G #28), which would mitigate the direct effect of tree removal on wildlife species. Also, the USFWS BO T&Cs for protection of Indiana bat would retain existing snag trees and benefit other wildlife. Removal of treetops and limbs (whole tree harvesting) would not be allowed, and only trees marked or designated for harvesting could be removed. Existing dead and downed large woody material (which provides habitat structure and diversity for various wildlife species) would remain on site throughout the proposed harvest units and adjacent forest.

No new road construction and relatively minor amounts of 4.0 miles of pre-haul road maintenance of the existing forest road system and old skid trails are proposed. Roads can cause direct effects to wildlife if they are barriers to travel routes for daily activities, dispersal, and migration. Forest roads and landings that remain open to the public can cause the direct effect of increased human access, which can cause the direct effect of wildlife mortality from road-kill, hunting and trapping, and cause adverse indirect effects on species intolerant of human activity (Deming 1994). Forest Management Practices (NHDFL 1997) and road closure S&Gs such as gates, berms, and rock barriers would limit motorized vehicle access within the project area upon completion of harvesting. Although hunting and human access can and should be regulated, it is an issue independent from silvicultural practices. The proposed road pre-haul maintenance and skid trail reuse, and the parking lot and universal access trail improvements under Alternative 2 would not create isolated habitat patches or restrict wildlife dispersal necessary for maintaining population viability. The WMNF FEIS analyzed the effects of road construction on wildlife, and Alternative 2 is within the range of effects (USDA-FEIS 1986, IV-27).

**Large Mammals (MIS White-tailed deer) (see TEPS section for MIS Canada lynx):** The white-tailed deer is one of the MIS for emphasis under the uneven-aged system in management area 3.1 (USDA-LRMP 1986a, VII-B-21, S&G #31). The availability of quality wintering areas for deer can be a limiting factor in their survival. Spruce-fir or hemlock stands are the basic cover component of most wintering areas. A management goal for most wintering areas, regardless of species composition, is to prolong the useful life of the area by perpetuating shelter, maintaining deer mobility and access throughout all non-regenerating segments of the wintering area, and providing preferred and accessible browse. As a minimum, at least 50% of the entire wintering area should be in “functional shelter” at all times. Functional shelter is defined as softwood cover at least 35 feet tall, with at least 70% crown closure (Reay et al. 1990).

Site-specific field reviews determined the Sugarhouse Project Area does not contain a known documented deeryard and the softwood areas within the stands proposed harvesting do not function as a core or primary yard habitat (Forest Service ID-Team; and NH Fish & Game review).

Alternative 2 would cause the direct effect of an increase in the amount of limbs and tops on the ground from harvested trees, which would provide a localized, short-term source of natural browse for MIS white-tailed deer when they need it most for overwinter survival. Mobility patterns of large mammals traveling to, from, or within the proposed Sugarhouse Project Area after harvesting activity would not be adversely affected by the proposed clearcut and group selection treatments. Skid trails and forest roads provide packed snow trails for animals such as bobcat, fisher, and coyote to move along while foraging. Large mammals such as moose and MIS white-tailed deer have large home ranges, and appear to adjust quickly to displacement from harvesting activity and may adjust their foraging behavior from day to night to avoid harvesting activity. Noise from logging equipment may cause a direct effect of displacing MIS white-tailed deer to other areas during the day, but they return at night to feed on down treetops. A moose was observed licking salt from harvesting equipment on an active logging operation on the White Mountain National Forest. On another forest, deer were observed browsing felled tree tops while forest workers continued operating nearby (personnel communication with Frank Hagan 2003). Alternative 2 would meet the Purpose and Need and would help move the forest towards the desired condition for HMUs 112 & 113 and for managing the stands for hardwood regeneration for management indicator species white-tailed deer forage habitat (USDA-LRMP 1986a, VII-B-21, S&G #33).

**Small Mammals (MIS Snowshoe hare) (see TEPS section for MIS American marten):** Because of the high reproductive rates of most small mammals, changes in their populations respond quickly. A study found that before

and immediately after cutting in a pine forest, the density of the small mammal population was low. However, by the time the second crop of grass and forb seed was on the ground, the small mammal population had peaked and declined slowly through the remainder of the regeneration period (Trousell 1954 cited in Harlow et al. 1997).

The relatively moderate amount of ground disturbance (in terms of magnitude and duration) during winter frozen ground conditions associated with harvesting approximately 871 treatment acres could temporarily interrupt the established territories and travel patterns of some terrestrial small mammal species with small home ranges such as MIS snowshoe hare, mice, vole, or shrew. Temporarily displaced from their immediate territories by the direct effects of soil or snow compaction or tree removal, these species would most likely occupy immediately adjacent habitat. Once harvesting activity is completed, over time these species or their offspring may return to reestablish their former territories within the harvested units. Furthermore, the WMNF Forest Plan Wildlife S&Gs, mitigation measures, and the USFWS BO Terms and Conditions as amended to the Forest Plan would retain wildlife cavity trees, snags and existing large woody material already on the ground for habitat structure for MIS snowshoe hare and other small mammals.

Alternative 2 could displace individual MIS American marten seasonally from portions of its home range because of increased human presence during harvest activity (assuming the project area is part of a marten's home range). Forest-wide wildlife monitoring data indicates marten are distributed across the northern portion of the WMNF and data suggests their populations are increasing (USDA-FS 2001a).

**Upland Game Birds (MIS ruffed grouse):** Alternative 2 would have the direct effect of creating open forage habitat suitable for MIS ruffed grouse. The MIS ruffed grouse requires early-successional young age-class, as grouse often nest in regenerating stands created through clearcutting. The dense cover in young stands may afford grouse protection from nest predators. Ruffed grouse nests located in dense shrub growth of 4-year-old clearcuts were found to be least susceptible to predation by crows and blue jays in central Pennsylvania (Yahner and Cypher 1987 in Harlow et al. 1997).

The American woodcock population is in decline in the Eastern Region (NHFG 2001/2002). The woodcock requires three distinct habitat types: brushy reverting fields for roosting, actively managed grassy fields for singing and courtship activities, and early-successional hardwood stands for nesting and feeding requirements. Woodcock forage largely on invertebrates such as earthworms found in rich loamy soils and other larval stages of Diptera (true flies) and Coleoptera (beetles) often associated with riparian zones (VFWD 1986). Some insects feed only on the plants that grow in early successional habitats (such as wild lupine and blueberries). Alternative 2 would have the direct effect of creating early successional young age class in the northern hardwood type suitable for American woodcock and MIS ruffed grouse needs.

**Neotropical Migratory Songbirds & Raptors (MIS Chestnut-sided, mourning, Cape May & pine warbler; Northern junco; Eastern kingbird & bluebird; Northern goshawk & broad-winged hawk):** A direct effect of tree removal through clearcutting, overstory removal, and group selection treatments may cause displacement from upper canopy habitat of various neotropical bird and hawk species. Other suitable upper canopy habitat would be available to these species in the large blocks of mature closed canopy forest within the HMUs 112 & 113 that are not subject to vegetation management. This mature habitat would remain long-term sources of closed-canopy habitat within the HMU. Trees containing raptor nests (none found) would not be harvested under the action alternatives, and a ¼-acre reserve group of trees would remain around any raptor nest site (NHDFL 1997). No harvesting activity would occur from March 15 through May 20 to avoid conflict with active raptor nests (USDA-LRMP 1986a S&G, III 18 & VII-B-20). The winter harvest mitigation measures proposed under Alternative 2 would avoid the direct effects of disturbance to songbird nests or eggs. The Proposed Action would not have a measurable negative effect on migratory bird populations hence the project complies with the Migratory Bird Treaty Act Executive Order 13186 and MOU. The 1918 MBTA was designed to forestall hunting of migratory birds and the sale of their parts, and was not intended to regulate timber harvesting.

Invertebrates: Alternative 2 would cause a localized direct effect of tree removal, hence a relatively minor reduction in the amount habitat available for some invertebrate species. There could possibly be a decline in the numbers of some invertebrate species within the newly harvested areas, skid trails, and landings, particularly units

suitable for summer harvest operations due to potential soil compaction.

### **Indirect Effects**

Forest roads and landings can cause beneficial indirect effects on various wildlife species by providing a long-term vegetative condition that does not exist in an interior forested environment. A study on the use of log landings by wildlife in the White Mountain National Forest found that landings provide a temporal and spatial extension of the early-successional habitat provided by clearcutting. No observations in the study suggest that negative effects result from the presence of log landings, and observations actually found that landings appear to benefit small mammal species associated with early seral stages and support localized populations after they no longer occur in the adjacent clearcuts. Landings also benefit many bird species by producing fruit and seed sources as forage (Tucker, 1992).

Existing roads and landings would be reused, and no new roads would be built in the Sugarhouse Project Area. All roads would continue with the same road management policies currently being implemented in this area.

**Large Mammals (MIS White-tailed deer) (see TEPS section for MIS Canada lynx):** Alternative 2 would cause an indirect effect of stimulating the softwood regeneration and growth, and increasing the hardwood browse beneficial to MIS white-tailed deer. Most studies indicate that the first few years after clearcutting, deer and moose foods (succulent stems of woody plants, forbs, and grasses) increase to their highest level of abundance and availability (Martin et al. 1955, Murphy and Ehrenreich 1965, Crawford et al. 1975, Smeins and Hinton 1987 cited in Harlow et al. 1997). Clearcuts have been found to enhance deer habitat in most regions, even in the snowbelt portions of the north central and northeast states, providing that nearby shelter against cold winter winds is available (Verme 1965, Krefting and Phillips 1970, Newton et al. 1989, Hughes and Fahey 1991 cited in Harlow et al. 1997). Because moose also require large volumes of succulent browse, they respond favorably to any disturbance that reduces overstory and increases shrubs within their reach. In clearcuts, preferred year-round forage from hardwood tree and shrub species occurs in great abundance. Clearcuts up to 200 acres have been found to support moose for up to 25 years, or until canopy closure shades out shrub-level browse production (Allen et al. 1988 cited in Harlow et al. 1997). The forest openings created by group and clearcutting treatments under Alternative 2 would increase browse for moose and MIS white-tailed deer. These native wildlife species inhabit a wide range of forest types and age classes in the northern hardwood forests. The amount of understory ground vegetation and reserve trees within the harvested stand after treatment, coupled with the surrounding uncut forest, would provide adequate food, shelter, and escape/hiding cover for various wildlife species (Gore 1988, cited in Deming 1994).

Alternative 2 would have the indirect effect of residual hardwood stumps sprouts providing browse for MIS white-tailed deer. Also, there would be an increase of herbaceous and berry producing shrubs in the open areas after harvest treatments beneficial to black bear as forage habitat. Analysis of bear food abundance in the Adirondack Mountains of New York indicated that even-aged, managed habitats provided the highest amounts of spring and summer foods (particularly raspberry and pin cherry), while non-managed and uneven-aged habitats provided the highest quantity of fall foods, particularly beechnuts. Habitat selection was greatly influenced by food abundance. The study found that almost all habitats were valuable during some time of the year, suggesting that a variety of habitats is beneficial to bears (Costello and Sage 1994 cited in Harlow et al. 1997). Under Alternative 2, the group selections would benefit black bear habitat. Few individual mast producing beech trees would be cut during harvesting, but mitigation measures would retain heavily used concentrations of beech trees scarred by foraging black bear. A review of stand data (district files) indicates that several northern hardwood stands within the HMUs 112 & 113 contain beech trees with sufficient size to produce beechnut mast. The relevant studies cited above support the reasonable conclusion that the harvest treatments proposed for the Sugarhouse Project Area would produce suitable habitat for moose, black bear, and MIS white-tailed deer.

**Small Mammals (MIS Snowshoe hare) (see TEPS section for MIS American marten):** Under Alternative 2, Forest Plan Riparian and Wildlife S&Gs (USDA-LRMP 1986a, III 15-19) would maintain existing and future wildlife cavity and snag trees and downed large woody material located within and immediately adjacent to the proposed harvest units, which would mitigate potential effects of tree removal. Maintaining this habitat diversity is

beneficial to MIS snowshoe hare, MIS American marten, small rodents, forest bats, birds, amphibians, reptiles, and invertebrates as potential roost, nesting, or forage habitat (Tubbs et al. 1987). In addition, more than 10% of HMUs 112 & 113 is managed under an extended rotation providing older trees as potential roosting and nesting habitat for forest bats, birds, and small mammals. The adjacent forest and the Pemigewasset Wilderness (located approximately 6 miles south of the Project Area) would also provide habitat available to MIS snowshoe hare, MIS American marten, forest bat, bird, and small mammal at the landscape level. The potential beneficial indirect effects of increased sunlight for solar warmth in the treated stands and of increased foraging areas in clearcuts and group selections could reduce or off-set any potential direct effects of tree removal on MIS snowshoe hare, MIS American marten, forest bats, birds, or small mammals.

A study of the American marten in northern Maine compared spatial characteristics of residual forest patches and their use by marten in an industrial forest landscape characterized by extensive timber harvesting. The study found that marten are not old-growth or coniferous forest obligates and that once regenerating stands reach 20 to 40 feet in height they are used by marten no differently than older stands (Chapin et al. 1995 cited in Harlow et al. 1997). See Appendix F for detailed analysis of potential effects to WMNF MIS and state-listed threatened American marten.

A study by Krusic et al. (1996) compared bat activity (primarily little brown bats) among four age classes of northern hardwood and spruce/fir forest stands on the White Mountain National Forest. Bat activity was highest in over-mature hardwood stands and in regenerating stands (0-9 yr old age class) of both forest types. The data indicated a mixture of forest types and age classes, including clearcut and group cut regeneration and over-mature hardwoods help fulfill the summer habitat requirements of forest bats (see Sugarhouse BE in the project file). Recent survey of woodland bats found no Indiana bat on the WMNF (Chenger 2002, Chenger 2004 unpublished).

Winter harvesting mitigation measures are proposed for the majority of the Stands, which would avoid disturbance to woodland bats because they are not present at that time. These stands contain a minor percent of potential suitable bat habitat on the WMNF (see the BE in the project file for detailed analysis of potential effects to Indiana and small-footed bats). The relevant and local studies cited above support the reasonable conclusion that the harvest treatments proposed for the Sugarhouse Project Area would produce suitable habitat for small mammals including MIS and woodland bats.

**Upland Game Birds (MIS ruffed grouse):** Alternative 2 would cause the indirect effect of increasing habitat diversity and the percentage of early-successional habitat for the MIS ruffed grouse and American woodcock via clearcut harvesting and perpetuating the 10 acre alder stand. Gullion (1990) found one-acre clearcuts with good aspen regeneration have provided the highest response/acre cut. By contrast, of 32 clearcuts less than one-acre in size made at the same time, breeding grouse used only five; suggesting one-acre size threshold that must be reached or exceeded before a clearcut would become an acceptable covert for ruffed grouse winter and breeding season use.

Designated landings, skid roads and trails, and Riparian and Fish Habitat Standards and Guidelines (USDA-LRMP 1986a, III 15-16) would protect and maintain habitat important to invertebrates as prey base for MIS grouse and the American woodcock. In eastern Maine, courting male woodcock habitat was improved by creating clearings five acres in size (Sepik et al. 1986 in Harlow et al. 1997). Habitat characteristics were measured near 89 nests of woodcock on Moosehorn National Wildlife Refuge, Calais, Maine. Forty-four of the 89 nests were in clearcuts less than or equal to 10 years old. Because nests often are associated with clearcutting and early successional stands of alders and shrub species, this study concluded that it is essential to provide these habitats for nesting birds (McAuley et al. 1996 cited in Harlow et al. 1997). The relevant studies cited above support the reasonable conclusion that the harvest treatments proposed for the Sugarhouse Project Area would produce suitable habitat for MIS ruffed grouse and American woodcock.

**Neotropical Migratory Songbirds & Raptors (MIS Chestnut-sided, mourning, Cape May & pine warbler; Northern junco; Eastern kingbird & bluebird; Northern goshawk & broad-winged hawk):** Alternative 2 would have the indirect effect of increasing open forage areas through the group selection and clearcutting treatments beneficial to MIS songbirds and hawks. Neotropical migratory bird research on the White Mountain National Forest (Costello 1995) indicated that clearcutting provides more opportunity than group selection for bird species that require early successional habitat to fulfill all or part of their breeding requirements. Clearcut openings

were higher in bird species richness, abundance, and diversity than group selection openings. The management indicator species chestnut-sided and mourning warblers were found in clearcuts and were the most abundant species observed in the group selection openings. Veery and eastern wood pewee are typically associated with older forest age classes (DeGraaf and Rudis 1986), and, although not breeding within clearcuts, they flew in and out and appeared to forage on the abundant fruit crops present, suggesting these clearcuts provide valuable foraging areas (Costello 1995).

A study of breeding bird assemblages in managed northern hardwood forests in New England found that during the first growing season after winter harvest, birds that nested in the stand do not return, but other species move in. Two years after cutting, there may be twice as many species, but a few that were present in the first year may no longer inhabit the site. During the third growing season, the number may double again (DeGraaf 1991). As even-aged forests progress through clearcutting to a mature state, each type and age-class supports a unique assemblage of bird species. Neotropical migrant songbird numbers were censused in clearcut stands of a spruce-fir forest in northern Maine, in a northern hardwood forest in Vermont, and in aspen and mixed oak forests of Pennsylvania. All three studies found that each seral stage (clearcuts, pole, and mature stands) was dominated by a characteristic group of birds (Titterton et al. 1979, Thompson and Capen 1988, Yahner 1986 cited in Harlow et al. 1997). These studies concluded that managers could encourage the presence of a variety of bird communities by maintaining a mixture of forested age classes. In New England's hardwood forests, mature even-aged and uneven aged stands were found to support many of the same bird species, but the younger even-aged stands provided habitat for species not found in uneven-aged stands. This study concluded that clearcut harvesting is decidedly beneficial to neotropical migratory songbird populations (DeGraaf 1987 & 1993 cited in Harlow et al. 1997). The relevant and local studies cited above support the reasonable conclusion that the harvest treatments proposed for the Sugarhouse Project Area would produce suitable habitat for Neotropical migratory birds and raptors (including MIS).

**Forest Fragmentation and Edge Effect:** Alternative 2 would create short-term, localized edge habitat along the boundaries of the units proposed for clearcutting and group selection treatments until the vegetation attained vertical height. Vegetation age-class or type conversion within a heavily forested landscape such as the White Mountain National Forest is usually not considered forest fragmentation.

Forest-interior (edge-avoiding) birds are vulnerable to brood parasitism by the brown headed cowbird and predation by blue jays, raccoons and red squirrels, particularly in forests fragmented with agricultural land with pasture used by cattle. Several studies suggest that nest predation of forest interior species in largely forested landscapes is not influenced by the presence of clearcuts. A study by DeGraaf and Angelstam (1993) on depredation on artificial ground and cup nests in even-aged seedling/sapling, pole, and mature stands of northern hardwood forest in the White Mountain National Forest found no increase in the nest predation rate in the early stages of stand growth, nor was rate of predation related to stand area. Another study in the same forest type compared predation rates in large blocks of managed areas vs. remote reserved areas. No differences in nest predation rates were found for either ground or shrub nests between the even-aged clearcut regenerated areas and the reserved forest blocks (DeGraaf 1995).

On the WMNF, the first two years of ongoing forest wide bird monitoring detected six cowbirds during point counts within managed, un-managed, and remote areas (Committee of Scientist wording) and during wetland inventories. Conversely, forest interior ovenbirds were found over 90 percent of the point count plots (USDA-FS 1993, Monitoring Report). Recent studies on the WMNF show no increase in brown-headed cowbirds (Yamasaki et al. 2000). Based on Breeding Bird Surveys (1966-98), species showing large or significant population declines within the Partners In Flight Physiographic Area 28 (including the WMNF) show declining trends for the brown-headed cowbird (Rosenberg and Hodgman 2000).

Since occurrence of cowbird and elevated predation rates are usually interpreted as an indication of fragmentation of the forest, the results of these studies and White Mountain National Forest bird monitoring suggest that hardwood-dominated forests in northern New England are not fragmented by even-aged management. Studies in the Midwest also suggest parasitism rates by cowbirds may be dependent on the landscape context and levels of

permanent forest fragmentation (agriculture, industry, and housing development) more so than on the distribution of temporary openings created by regulated timber harvesting (Thompson 1992 cited in Harlow et al. 1997). Because some bird species prefer edge habitat, young successional stages within older forests can enhance species diversity. A study found that species richness was higher along edges than interiors of stands in both seasons. Winter birds avoided edges of clearcut stands, but spring birds used edges extensively (Yahner 1987 cited in Harlow et al. 1997). Ovenbird habitat use and reproductive success were examined in northern New Hampshire to determine the effect of edge in predominately-forested landscapes. The proportion of nests that failed from all causes, including predation, was higher along edges in 1992 but not in 1993. The number of young fledged per female and the proportion of pairs fledging at least one young did not differ between edge and interior in either year. This study concluded that the effects of clearcutting are moderated by the abundance of mature forest cover in the region and by the tendency of ovenbirds to re-nest after initial nest failure (King et al. 1995 cited in Harlow et al. 1997). These local studies suggest that in large forest tracts like the White Mountain National Forest, applying a mix of both methods would cause no adverse effects to Neotropical migrant songbirds.

The clearcut prescriptions with reserve trees for the Sugarhouse Project Area are consistent with the US Fish and Wildlife Service Biological Opinion Terms and Conditions (USDI 2000), which would afford vertical structural diversity through the retention of scattered pole sized or larger mature trees within the regenerating harvest units. As the regenerating units develop, the residual trees would provide a component of large over-mature trees within each respective unit. Eventually many of them would probably become cavity trees, providing vertical structural diversity available to wildlife for roost or nest habitat for songbirds, small mammals, forest bats, hawks, and woodpeckers.

Invertebrates: Although Alternative 2 could cause a decline in the overall numbers of some invertebrate species or their habitat within the harvested areas, skid trails, and landings, indirect effects are likely minimal and localized as some invertebrate species present in the adjacent undisturbed forest blocks could reasonably reoccupy newly created early successional habitat over time.

### **Alternative 3:**

This alternative would treat the same stands as Alternative 2, except two Stands 23 and 24 prescribed for single tree and group selection totaling 142 acres are deferred. Winter mitigation measures described under Alternative 2 would apply.

### **Direct and Indirect Effects**

This alternative would have similar direct and indirect effects on wildlife and their habitat as described under Alternative 2.

MIS that use the regeneration age class of the northern hardwood community type would find the same amount of this habitat available within the Project Area. The same amount of clearcut acres would provide suitable habitat to these management indicator species and to forest bats foraging in canopy gaps from the clearcut and group selection treatments. Single-tree selection treatments would not initiate softwood regeneration or conversion to this habitat type, but would maintain similar amounts of mature forest hardwood habitat for MIS broad-winged hawk and the ovenbird.

Alternative 3 would provide similar amounts of successional habitat suitable to the majority of MIS as Alternative 2, since approximately 10% of native forest wildlife species use mature or over-mature forest stands (USDA-LRMP 1986a, VII-M-6, IV-43). This alternative would provide an opportunity for creating early successional habitat for MIS songbirds, MIS grouse, MIS white-tailed deer, moose, and black bear. Species, such as the MIS chestnut-sided and mourning warblers that nest and feed in clearcuts may use larger group cuts as well. Some species would benefit from the combination of mature and regenerating forest conditions that would be created with clearcut and group selection and single-tree treatments. Alternative 3 has similar potential to move the forest towards the DFC for diverse early-successional habitat for wildlife needs compared to Alternative 2.

### **Wildlife MIS Population Trends and Viability within the Forest-wide Planning Area:**

Based on the potential direct, indirect, and cumulative effects the No Action alternative would add to a declining amount of early-successional habitat within the Sugarhouse Project Area. However, the No Action alternative in the near term **would not adversely affect population trends and viability of WMNF MIS within the forest-wide planning area.** The Proposed Action and Alternative 3 would reduce the amount of mature and over-mature habitat and inversely increase the amount of early successional habitat within the Project Area. However, The Proposed Action and Alternative 3 **would not adversely affect population trends and viability of WMNF MIS within the forest-wide planning area** (see the WMNF PVA USDA-FS 2001a in the Sugarhouse Project files).

### **Cumulative Effects on Wildlife Resources**

The HMUs 112 & 113 were used as the cumulative effects analysis area to facilitate evaluation of past, present, and reasonable foreseeable future effects on wildlife resources. The temporal scope is 10 years (period of time between HMU reevaluation for 0-9 yr. age class). The HMUs 112 & 113 includes the habitat needs of large mammal MIS with wide home ranges and evaluation of habitat distribution (Vegetation Report). Because the home range and habitat needs of wildlife vary by species (DeGraaf et al. 1992), the HMUs 112 & 113 also includes the smaller site-specific Sugarhouse Project Area that contains the home range of small mammal MIS, amphibians, and reptiles. The TEPS section of this analysis also used the broader WMNF landscape and regional analysis scales to assess potential cumulative effects to habitat distribution and connectivity with respect to wildlife population trends and viability within the forest-wide planning area (36 CFR 219.19).

#### **Alternative 1 (No Action)**

This alternative would add an adverse cumulative effect to the steadily declining trend in early-successional, regeneration-age class of northern hardwoods and aspen/birch community types within the Project Area and at the larger HMU, Forest-wide, and New England regional scales. Because of a decline in early-successional habitat, Neotropical migrant MIS chestnut-sided and mourning warblers and snowshoe hare, and upland opening MIS Eastern kingbird and MIS bluebird that rely on early-successional age class and/or aspen/birch community type would potentially decline within the Sugarhouse Project Area. Overall, wildlife habitat and species biodiversity within the Sugarhouse Project Area could decline (NHFG 1996). At the landscape scale, this alternative would add to the cumulative effects of a maturing forest, which is steadily increasing over the past several decades across the White Mountain National Forest, as well as across New England forested landscapes (USDA-FS 1993).

#### **Alternatives 2 & 3**

The recent ongoing Nubble Timber Sale is located approximately 3 mile northeast of the Project Area in HMUs 110 & 111. The recent Bickford Timber Sale and CCC Timber Sale are located east of the Project Area in HMU 111. These recent harvests showed no evidence of major erosion, insect infestation, or disease during sale administration. The recent EAs completed for these Timber Sales determined little to no cumulative effects to wildlife resource from implementation of any of the action alternatives. There are no other vegetation management projects anticipated in the Sugarhouse Project Area within the foreseeable future (2016). Past NEPA decisions involving vegetation management in the vicinity have not contributed substantially to the age class diversity within the cumulative

effects area or nearby due to relatively small amount of acres treated. Also, stands treated in the Bickford Timber Sales will grow out of the early successional stage into the next age class in approximately 9 years. These areas would no longer provide early successional habitat for wildlife species that use this habitat. The early successional age class habitat is declining in HMUs 112 & 113 and on the White Mountain National Forest landscape, and New England region over the past several decades (USDA-FS 1993).

Future non-Forest Service actions on private land adjacent to the forest and the HMUs 112 & 113 are not expected to create substantial amounts of large opening or early successional habitat suitable to wildlife species that use this habitat. Any Forest Service non-vegetation management projects within the cumulative effects area would contain a similar mix of wildlife standards and guidelines as described for the Sugarhouse Project.

Based on relatively minor, localized, and short-term direct and indirect effects to wildlife and/or their habitat from past, recent, and foreseeable future actions, the action alternatives of the Tintah Project **would not add adverse cumulative effects** to wildlife resources. The action alternatives would have a positive cumulative effect of creating early successional habitat within the cumulative effects analysis area.

The potential effects on the Wildlife Resources described in this Functional Report are within the range of effects to wildlife resources analyzed in the FEIS for the White Mountain Forest Plan (USDA-FEIS 1986, IV-62).

### **Effects Determinations for Federal TEPS**

In summary, there are no known documented occurrences of TEPS wildlife species within the Sugarhouse Project Area. The potential effects to TEPS wildlife species include the same direct, indirect, and cumulative effects previously described under the terrestrial wildlife resource section.

The Sugarhouse BE compared the potential site-specific effects of the Project to those disclosed in the WMNF Programmatic Biological Assessment (BA) (USDA-FS 1999) of continued implementation of the 1986 WMNF Forest Plan. The Sugarhouse BE determined there would be no additional effects outside those evaluated in the WMNF programmatic BA. The USFWS is expected to concur that the Sugarhouse Project is consistent with the Reasonable and Prudent Measures and Terms and Conditions of the USFWS BO (USDI-FW, 2000). The Sugarhouse BE also documents compliance with the WMNF TES Forest Plan Amendment (USDA-FS, 2001), which incorporated the Reasonable and Prudent Measures and Terms and Conditions outlined in the U.S Fish and Wildlife Service Biological Opinion (USDI-FW, 2001). The Sugarhouse Project is unaffected by the recent national lynx lawsuit, in which the U.S. Fish and Wildlife Service was enjoined from concurring on determinations where the project “may affect” the Canada lynx. Because the Sugarhouse BE determination for Canada lynx is “no effect”, the judge’s ruling in this case does not apply.

### **Effects Determinations for Other Species of Concern**

Appendix G discloses the Other Species of Concern on the WMNF having probability of occurrence within the Sugarhouse Project Area. The potential effects to other species of concern include the same direct, indirect, and cumulative effects previously described under the terrestrial wildlife resource section.

The No Action and all action alternatives of the proposed Sugarhouse Project would cause no

adverse effects to the other species of concern or their suitable habitat shown in Appendix G. The majority of the stands in the Project Area would be harvested during winter months when these species are dormant and/or a relatively small amount of suitable habitat would be affected. Also, the action alternatives would either create and/or perpetuate suitable habitat for these species.

### **Cumulative Effects:**

The analysis area for assessing potential cumulative effects to TEPS species taken from the Sugarhouse BE included site-specific Sugarhouse Project Area (small home range) and the broader WMNF landscape and Lynx Assessment Unit 10. The Partners In Flight Physiographic Area 28, and the New England and White Mountain subsection regional scales were also used to assess cumulative effects to TEPS and other species of concern population viability. The temporal scope varied to include the past 3 yrs to future 10 years (when USFWS T&C implemented and HMUs reevaluated).

The Sugarhouse BE considered the effects determinations from past BEs completed for the recent Timber Sales mentioned above (located near the Sugarhouse Project Area). The USFWS is expected to concur with the Sugarhouse BE findings of no adverse cumulative effects from past, present, and reasonably foreseeable projects on TEPS.

### **Summary of National Level & Forest-wide Effects Analysis for Federal TEPS Wildlife Species.**

**Nation-wide BA and BO for Canada lynx:** The Forest Service agency completed a nation-wide BA of the effects of the continued implementation of National Forest Land and Resource Management Plans and Bureau of Land Management Land Use Plans on Canada lynx (*Lynx canadensis*) in the contiguous United States (USDA-BLM 1999). Subsequently, the USFWS rendered a Biological Opinion (BO) at the national-level (USDI 2000b), which concurred with the Forest Service that continued implementation of current nation-wide Forest Plans as implemented in conjunction with the Conservation Agreements, are “**not likely to jeopardize the continued existence of the Canada lynx**”. The multi-agency Canada Lynx Conservation Agreement and Strategy (CLCAS) outlined Standards and Guidelines for conservation of the Canada lynx habitat. In addition, the USFWS BO for the forest-wide BA for the WMNF rendered a “**not likely to jeopardize the continued existence of Canada lynx**” (USDI 2000). The forest wide BO stated lynx appears to be extirpated from the WMNF and it is very rare and possibly extirpated statewide.

**CLCAS Standards and Guidelines:** The USFS entered into a conservation agreement with the USFWS to implement the CLCAS to conserve all lynx habitat on National Forest lands within the range of lynx (Ruediger et al. 2000). The CLCAS describes a Lynx Assessment Unit (LAU) process to define suitable habitat for management of lynx habitat. Although Canada lynx are considered likely extirpated from NH forests, the Sugarhouse Project Area is located within LAU 10. The project specific Sugarhouse BE addressed the Standards and Guidelines outlined in the CLCAS and the potential effects to LAU 10 are summarized in the effects section of this analysis. FS field reviews of portions of the proposed Project Area during various time of the year, and Forest-wide winter track monitoring surveys from 1993 -

1996 (including transects near the Project Area) documented no sightings of TEPS such as lynx or tracks, excavations, and fecal pellets (USDA 1996). The WMNF is participating in the Nationwide Lynx Detection Surveys, collecting hair samples for genetic DNA analysis. Several years of collecting samples in suitable lynx habitat Forest-wide detected no evidence of lynx on the WMNF to date.

**WMNF Forest-wide Biological Assessment (BA):** The WMNF completed a Forest-wide BA of the potential effects to TEPS from continued implementation of the 1986 Forest Plan (USDA 1999). The USFWS rendered a Biological Opinion (BO) with an Incidental Take Statement (USDI 2000). The USFWS concurred with the findings of WMNF BA that continued implementation of the Forest Plan would cause either: a beneficial effect; a no effect; and/or not likely to adversely affect the majority of TEPS species for the WMNF; and is not likely to jeopardize the continued existence of Canada lynx and Indiana bat.

**Terms & Conditions (T&Cs):** The USFWS BO outlined T&Cs for protection of the Indiana bat. A TES amendment to the WMNF Forest Plan (USDA-FS 2001) includes the T&Cs of the BO, which the project specific Sugarhouse BE addressed. The Sugarhouse Project Area does not contain caves or mine tunnels often used as overwintering habitat (hibernacula) elsewhere by the Indiana bat (*Myotis sodalis*) or the small-footed bat (*Myotis leibbi*). Depending on the treatment such as clearcut, existing cavity trees (potential summer roosting or nesting habitat) for bat, bird, and small mammal species would be available within and immediately adjacent to the proposed harvest units, and within the surrounding forest

#### **3.10.4 Invasive Plants**

This Report describes the existing condition of the Federal-listed threatened, endangered, proposed (TEP), Regional Forester Sensitive Species (RFSS), other species of concern (OSC) plants and non-native invasive species (NNIS) within the affected environment of the Sugarhouse Project Area located in Grafton County, NH. The Federal and Regional Forester-listed plants are here in after referred to TEPS. This report analyzes the potential direct, indirect, and cumulative effects on TEPS & OSC plants and NNIS from the No Action and both action alternatives of the proposed Sugarhouse Project.

## **AFFECTED ENVIRONMENT**

The Project Area contains a mixed northern hardwood forest with spruce / fir component. See the Wildlife & Fisheries Specialists Reports in the Project File for a complete description of the habitat types and features.

### **TEPS Plant Surveys & Field Reviews:**

The FS ID-Team and botanist field reviewed the proposed Project Area at various times of the year including periods of flowering and leaf off. The FS site-specific botanical surveys (Larson 2004) documented no occurrence of TEP, OSC plants or NNIS in portions of the hardwood, softwood, and riparian habitat within the Project Area having highest probability of occurrence (see the project file). However, a population of several RFSS squirrel corn plants (*Dicentra canadensis*) were found in two locations in the Project Area. Excluding the known location of

squirrel corn, FS Biological Technicians also conducted stream /riparian surveys in the Project Area and found no further TEPS and OSC or NNIS (USDA-FS 2004) except the documented squirrel corn.

## **ENVIRONMENTAL CONSEQUENCES**

### **Direct and Indirect Effects to TEPS, OSC, and NNIS**

The general effects of timber harvesting activities on vegetative diversity can be found in the Forest Plan FEIS, pp. IV-32 and IV-33. For a discussion of general effects of timber harvesting on vegetation see the Project File.

#### **Alternative 1 – No Action**

Under No Action, vegetation in the Project Area would continue to grow and mature. Some trees and understory shrubs and herbaceous vegetation would die from natural forces related to size, competition, or age stress. Natural forces such as wind, ice storms, or fire could occur. These events occur at random and infrequently cycles. Course woody material would be recruited on the forest floor as trees die.

The No Action alternative would cause no direct or indirect effects of trampling, soil compaction, or increased sunlight for TEPS or OSC plants or introduce and spread NNIS within the Project Area due to no activity at this time.

#### **Alternative 2 - Proposed Action**

**Direct Effects:** The potential direct effects to TEPS or OSC plants from single-tree, uneven-age, or clearcut harvests within the Project Area are anticipated to be overall relatively localized, and minor to none. Potential direct effects to understory vegetation include trampling and/or soil compaction by during harvest operations and trailhead parking lot and universal access improvements. However, designated skid trails would minimize overall understory vegetation and soil disturbances during harvesting, and the majority of the units are proposed for winter harvest when snow and frozen ground conditions would minimize potential effects to understory vegetation. The existing foot trail in the Project Area is hardened and has common vegetation in the center and along the margins. Also, some of the TEPS plants having low probability of occurrence within the Project Area such as Bailey's sedge and broad-leaved twayblade favor wet areas, which are routinely excluded from harvest units and skid trail layout.

**Indirect Effects:** Potential indirect effects of the Alternative 2 include increased or varied sunlight reaching the forest floor from opening the canopy via harvest treatments, which could benefit shade intolerant plants such as RFSS clustered sedge that favors open woods and clearings, but would not benefit shade tolerant plants such as broad-leaved twayblade that favors deep shade. Vegetation management would cause the direct effect of a minor reduction in suitable habitat for plants.

**NNIS:** Under Executive Order 13112 (February 3, 1999), Federal agencies who actions may affect the status of invasive species shall not authorize, fund, or carry out actions that are likely to cause or promote the introduction or spread of invasive species in the U.S. or elsewhere unless the agency determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species.

Roads can serve as major corridors for the dispersal of invasive plants through the spread of seed propagules (seeds or vegetative fragments) that attach to vehicles. Resulting weed infestations can extend from the road's edge to 250 meters into the adjacent forest, or beyond (Saunders et al. 1991; Primack 2000; Forman and Deblinger 2000). The No Action and both of the action alternatives do not include new road building or specific activities that would purposely introduce NNIS into the Project Area. All actions would be consistent with the

1999 Invasive Species Executive Order 13112 and Standards and Guidelines to prevent the introduction and spread of noxious invasive weeds outlined in the FS Weed Prevention Practices Guide (USDS 2001) would be followed.

**Alternative 3:** The potential direct and indirect effects discussed under Alternative 2 would be the same for Alternatives 3 because the same stands (except Stands 23 & 24 deferred) would be affected via mostly winter harvest. However, fewer acres are affected under Alternative 3.

### **Cumulative Effects on TEPS, OSC, and NNIS:**

The analysis area for past, present and reasonably foreseeable future effects to TEPS and OSC plants and NNIS included the Project Area and the forest-wide planning area to address population viability. The temporal scope is 10 years when HMUs are reevaluated.

**Alternative 1:** The No Action would cause no direct or indirect effects of trampling vegetation, soil compaction or increased sunlight into the stands in the Project Area due to no harvest activity. Thus no cumulative effects to TEPS or OSC plants or introduction or spread of noxious invasive weeds are anticipated.

**Alternatives 2, 3:** The action alternatives would cause relatively very minor to no direct or indirect effects to TEPS or OSC plants and not purposely introduce or spread NNIS. Therefore, there would be no cumulative effects to TEPS or OSC plants or introduction or spread of NNIS.

## **3.12 Heritage Resources**

### **Affected Environment for Heritage Resources**

#### **3.3.2 Cultural Resources**

A cultural resource survey has been conducted for the Sugarhouse Project area (CRRR# 01-04-118 and 01-03-120). No prehistoric sites were found. The historic sites found included:

- The Profile and Franconia Notch Railroad (1879-1920) grade outside of proposed harvest units.
- Two sugarhouse sites.
- Two logging camp sites.

The Sugarhouse Project Area is a heavily forested area along Route 3. The five cultural sites in the project area are a result of past land use history. There may be additional sites in the project area that have not been discovered.

#### **3.3.2.3 Direct and Indirect Effects**

##### **Alternative 1 – No Action**

No activities are proposed for this entry under Alternative 1. Current level of public visitation may result in some impacts to sites that will be addressed by standard Forest Service cultural resource and law enforcement policy.

### **Alternative 2-3**

The White Mountain National Forest works in consultation with the New Hampshire State Historic Preservation Office to design projects that are determined to have no effect upon cultural sites in accordance with 36 CFR 800 and The National Historic Preservation Act of 1966, as amended.

Current level of public visitation may result in some impacts to sites that will be addressed by standard Forest Service cultural resource and law enforcement policy.

Under Alternatives 2-3, known sites within the project area will be avoided during layout, marking, and logging operations. Avoidance and site mitigation measures are designed to eliminate or lessen any impacts to heritage sites or site values from timber harvesting. Sites will be identified on the sale area map and included in the timber sale contract. This will ensure that sites are protected and avoided during logging operations and will prevent heavy equipment and other sale activities from disturbing sites. Mitigation measures for over snow and/or frozen ground will stop or appropriately minimize impacts to the railroad grade. If the mitigation measures are followed, no effects to cultural resource sites in the Sugarhouse Project Area are anticipated.

The mandatory heritage clause within the timber sale contract is worded to address the possibility of finding additional cultural sites and outlines steps for managing them through contract modification to address heritage values present.

Short-term changes in the vegetation may draw the public's attention to certain sites. The Forest will take steps to educate the public about protection of cultural sites and their role to leave sites as they find them. As the vegetation regenerates site locations should be less visible and less of a temptation to the public.

On 7-8-2004 the Forest Service received a letter from the State Historic Preservation Officer concerning the cultural sites in the Sugarhouse Project Area. That letter stated, "Based on the project review documentation which you have submitted to the Division of Historical Resources and through our discussions pertaining to the protection of identified historic sites, it appears that the undertaking, as proposed, will have 'no adverse effect,' pursuant to 36 CFR Part 800.5, on any properties or districts that are listed in or may be eligible for the National Register, nor properties of known or potential architectural, historical, archaeological or cultural significance, if the work is done as discussed."

#### **3.3.2.4 Cumulative Effects**

For cultural resource analysis purposes, the scope of the cumulative effects area is through the year 2014 for the Gale River subwatersheds. There has been some timber harvesting in the area during the past 25 years, including the Skookumchuck, Priest Hill, Five Corners, and Jordan Brook Vegetative Management projects. Similar mitigation measures will be used on the Sugarhouse Project Area to avoid and protect known cultural sites. This has been accomplished during project layout and throughout the project. No additional projects are anticipated in this area in the foreseeable future.

No cumulative effects are anticipated beyond the effects discussed in section **3.3.2.3 Direct and Indirect Effects**, above.

### 3.13 Socio-Economics

#### Affected Environment for Socio-Economics

#### Community, Environmental Justice, & Economics

##### Community, Environmental Justice, & Economics Affected Environment

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The Sugarhouse Project Area (3,000 Ac) is located on federal land in the Towns of Bethlehem and Franconia in Grafton County, (Map 1). Bethlehem is located by road approximately 7 miles north of the Project Area and Franconia is about 6 miles northwest. Bethlehem is a rural residential community with a population of 2,242 people / 589 families and Franconia has 924 people / 243 families (2001 census data). Local employment includes Profile Junior and Senior High School, White Mountain School, Bethlehem Elementary School, Garnet Hill Company, Pine Tree Power Inc., Franconia Notch State Park, and the Towns of Bethlehem and Franconia. Less than ten percent of the population (7.9% of the families) is below the poverty level. (Demographic information from 2003 Economic & Labor Market Information Bureau, NH Employment Security; updated 05/30/03).

Route 3 is a paved, all weather road that provides a connection between I-93 and Twin Mountain, NH. Traffic is moderate along this stretch of road which is the primary access into the project area. Boston is the largest nearby city and is 150 miles away.

Federal land ownership in the towns of the Bethlehem and Franconia land base is 30,639 and 26,057 acres respectively. Rural communities that include federal land depend for part of their operating revenue on money generated by Forest Service harvesting activities (Timber Tax receipts and disbursements from states to towns from the Secure Rural Schools and Community Self Determination Act, commonly referred to as the Twenty-five Percent Fund Fund). The 2004 receipts to Bethlehem and Franconia were \$42,751 and \$36,357 respectively.

Bethlehem and Franconia receive economic benefits from timber harvesting that occurs on federal land within the towns. Sugarhouse is within the Towns of Bethlehem and Franconia. Therefore, the cumulative effects area for Community, Environmental Justice, & Economics is limited to Bethlehem and Franconia.

The Forest Service has numerous costs associated with implementing a project on the National Forest. Planning costs are 'up front' and involve a number of preliminary steps and associated costs. Planning activities include: silvicultural and biological surveys; fieldwork, development of stand prescriptions, and project layout; data collection and entry; planning meetings; public involvement; and preparation of an environmental assessment and decision documents.

The following table shows the average unit costs for planning and implementing projects on the Ammonoosuc-Pemigewasset Ranger Districts. This represents the cost of doing business and is incurred even if the no action alternative were to be chosen. Timber management

projects have associated sale preparation (marking, appraisal, advertising) and sale administration costs (sale inspection, accounting, billing, administration). Cost figures are based on FY04 District work plans and are adjusted for complexity (accessibility of the project area and the time necessary to complete field work).

**Ammo/Pemi District FY04 Project Costs/MMBF**

ACTIVITY	ASSOCIATED COST/ MMBF
<b>Costs:</b>	
<b>Planning</b> (inventory, mapping, layout, prescribing, NEPA)	\$35,200
<b>Sale Preparation</b> (marking, appraisal, advertising)	\$31,300
<b>Sale Administration</b> (sale inspection, accounting, billing, administration)	\$13,200
<b>Total Costs to Produce and Administer a Timber Sale</b>	<b>\$79,700</b>

The potential value for timber is the average of (green, no salvage) timber sales sold on the Ammo/Pemi District in FY03.

**Timber Sales Sold on the Ammonoosuc-Pemigewset Ranger District of the White Mountain National Forest in FY03**

Sale Name	FY Sold	Total Value	Total Volume	Average Value/ MMBF
<b>Mack Brook</b>	2003	\$399,752	2.6 MMBF	\$153,751
<b>Hix Mountain</b>	2003	\$345,657	1.2 MMBF	\$288,046
<b>Moose Watch</b>	2003	\$423,203	1.8 MMBF	\$235,113
<b>Clear Brook</b>	2003	\$239,854	1.7 MMBF	\$141,091
<b>Haystack</b>	2003	\$721,394	3.2 MMBF	\$225,436
<b>Average Value/MMBF over 5 Timber Sales in 2003 on the Ammo/Pemi Ranger District</b>				<b>\$161,738</b>

Community, Environmental Justice, & Economics Direct and Indirect Effects

Many of the values generated by the alternatives (positive and negative) involve goods and services that are not priced in the market place and are not represented in this comparison. These goods and services involve such things as the value of a hunting experience, a hike in the woods, watching wildlife, or the quality of water flowing from the project area. Possible effects each alternative has on these types of non-priced goods and services can be found

elsewhere in Chapter 3 under other resource headings. The cost of producing some of these non-priced goods, i.e. creating new wildlife habitat, is included in the total cost figures.

Basic cost benefit analyses are provided for each alternative. Costs and revenues are not intended to be absolutes, but to display the relative differences between alternatives.

The work involved in planning and analyzing this project included the fieldwork and analysis necessary to evaluate a maximum number of treated acres and associated volume (Alternative 2, 3.8 MMBF). If a lesser number of acres and associated volume are proposed and analyzed in another alternative, the overall planning costs of the project would be the same:

$$3.8 \text{ MMBF} \times \$35,200 = \$133,760$$

The following table displays the federal cost/benefit analysis for the implementation of Alternatives 1-4 and the potential 10% Timber Tax revenue for Bethlehem and Franconia.

**Net Return to the Federal Treasury, Contribution to the 25% Fund, and Timber Tax Revenue From Implementation of Alternatives 1-4**

<b>Activity</b>	<b>Alt 1</b>	<b>Alt 2 (3.8 MMBF)</b>	<b>Alt 3 (3.4 MMBF)</b>
<b>Costs:</b>			
Planning	\$133,760	\$133,760	\$133,760
Sale Prep	\$0	\$118,940	\$106,420
Sale Admin	\$0	\$50,160	\$44,880
<i><b>Total Costs:</b></i>	\$133,760	<i><b>\$302,860</b></i>	<i><b>\$285,060</b></i>
<b>Revenue:</b>	\$0	<i><b>\$614,604</b></i>	<i><b>\$549,909</b></i>
<b>Total Net Value</b>	<b>-\$133,760</b>	<b>\$311,744</b>	<b>\$264,849</b>
<i><b>Potential Contribution to the 25% Fund</b></i>	\$0	\$77,936	\$66,212
<i><b>Potential 10% Timber Tax Revenue for Bethlehem and Franconia</b></i>	\$0	\$61,460	\$54,990

**Alternative 1 - No Action**

With implementation of Alternative 1, no vegetative treatments would be carried out during this decade. The monetary cost to the government for implementation of Alternative 1 includes the project planning costs and the normal custodial/stewardship costs associated with managing a National Forest (the same for all alternatives and not part of the cost benefit calculations). Because there would be no timber harvested under Alternative 1, there would be a net loss to the federal government, no timber tax returned to the Towns of Bethlehem or Franconia, and no money contributed to the 25% Fund.

**Alternatives 2 and 3**

There would be limited seasonal employment and income opportunities generated by timber harvesting from the implementation of Alternatives 2 and 3.

The Revenue figure in the Table above, is used as the estimated bid value of the timber that would be harvested from the Sugarhouse Project. Using an average timber tax value of 10%, the approximate Timber Tax revenue returned to Bethlehem and Franconia is displayed below. Payments under the Timber Tax would be spread over the life of the sale.

**Cumulative Effects on Community, Environmental Justice, & Economics**

The cumulative effect on economics is based on timber harvested on the National Forest that generates revenue for towns in two ways, directly from Timber Taxes and indirectly disbursed from the 25% Fund. Counties receive the monies to be distributed to the towns and schools effected by the National Forest.

Under all action alternatives, there would be limited seasonal employment and income opportunities generated by the timber harvesting.

There are three projects on federal land in Bethlehem and Franconia that need to be included in past and foreseeable future actions. Harvesting started in Bickford, Haystack, and Moosewatch timber sales in 2004. The Bickford Sale is anticipated to close in 2006; the Moosewatch Sale is anticipated to close in 2007; and the Haystack Sale is anticipated to close in 2008. Therefore, the time frame for the cumulative effects analysis is 1997-2014. The following table displays the value or potential value of past and foreseeable future activities from Forest Service projects in the Towns of Bethlehem and Franconia in addition to Sugarhouse.

**Cumulative Values/Revenues from Forest Service Activities in the Town of Bethlehem and Franconia 1997-2014**

Project	Potential 25% Fund Revenue Generated 1997-2014				Potential 10% Timber Tax Generated 1997-2014			
	Alt. 1	Alt. 2	Alt. 3		Alt. 1	Alt. 2	Alt. 3	
<b>Sugarhouse</b>	\$0	\$77,936	\$66,212		\$0	\$61,460	\$54,990	
<b>Bickford</b>		\$57,221				\$57,221		
<b>Haystack</b>		\$1,213				\$1,213		
<b>Moosewatch</b>		\$101,086				\$101,086		
<b>Total</b>	<b>\$0</b>	<b>237,456</b>	<b>225,732</b>		<b>\$0</b>	<b>220,980</b>	<b>214,510</b>	

**Alternatives 1-3**

The Table above displays the potential revenue generated by Forest Service activities in Bethlehem and Franconia from 1997-2014. Alternatives 2 and 3 have the potential to generate the most revenue and Alternative 1 the least. None of the alternatives would negatively affect low income families in Bethlehem and Franconia.

## CHAPTER FOUR

### PREPARATION & CONSULTATION

#### 4.1 ID Team Members and Forest Service Contacts

The following individuals participated in development and analysis of the proposed action and all other alternatives as well as subsequent preparation of the environmental assessment.

Interdisciplinary Team:

Clara Weloth	Wildlife and Fisheries Biologist
Steve Wingate	Assistant Ranger - Forester
Dave Govatski	Forester
Art Gigliello	Assistant Ranger - Recreation
Steve Fay	Soil Scientist
Tracy Weddle	Hydrologist
Ken Allen	Landscape Architect

Forest Service Personnel consulted for professional and technical assistance:

Karl Roenke	Forest Archeologist
John Williams	Forestry Technician & Timber Sale Administrator
Jim Hill	Heritage Resource Paraprofessional
Dave Batchelder	NEPA Specialist
Erin Larson	Botanist

#### 4.2 Other Agencies and Individuals Contacted

Other agencies and organizations consulted for professional and technical assistance:

Will Staats	New Hampshire Fish & Game Department
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***SUGARHOUSE VEGETATION  
MANAGEMENT PROJECT***

**Environmental Assessment**

**APPENDICES**

- Appendix A: Project Maps**
- Appendix C: Scoping Comments**
- Appendix D: Mitigation Measures**
- Appendix E: Literature Cited**
- Appendix F: Glossary**

INSERT MAP

INSERT MAP

INSERT MAP

## APPENDIX C – List of 30-Day Comments received and responses

Three comments received during the 30-Day Comment Period (December 23, 2004 – January 23, 2005) were reviewed to identify specific issues and concerns. Each comment is listed with a response of how the comment was addressed.

### Comment

- I support the Sugarhouse Project as proposed.
- After reading your plan I am in favor of your plan and thank you for a job well done.

### Disposition

- Your support has been noted.

### Comment

- I continue to be disappointed in the minimal amount (26 acres) of regeneration hardwood that is planned. We all know that the acreage currently existing in regeneration hardwood is significantly short of the Forest Plan prescription. As an avid hunter, photographer, and observer of wildlife I continue to urge you to move the forest closer to the planned prescription. The wildlife will be appreciative and so will the visiting public who observes wildlife . . . I'm in support of Alternative 2.

### Disposition

- The Forest Service staff searched for opportunities to conduct even aged management using clearcutting to create early successional habitat. The project area had limited acreages of stands that would fit into prescriptions for clearcuts. The high quality of the forested stands obligated us to use uneven-aged management via single tree selection or group selection harvests. We are required to use a Statement of Optimality when deciding on using clearcutting and the stands did not meet the optimality condition described in the Forest Plan.

All correspondence is filed and available for public inspection in the Sugarhouse Project Planning Record located at the Ammonoosuc-Pemigewasset Ranger Station in Bethlehem, NH.

## List of Scoping Report Comments and Responses

Each comment received during the April 2004 scoping period was reviewed to identify specific issues and concerns. Each comment is listed with a response of how the comment was addressed and where supporting information can be located in the EA.

Where possible in the following discussions, the respondent is quoted directly and in the context of their full comments. All correspondence is filed and available for public inspection in the Sugarhouse Project Planning Record located at the Ammonoosuc-Pemigewasset Ranger Station in Bethlehem, NH.

### **Bike Path:**

#### **Comment:**

- I think the proposed bike path extension should be taken into consideration before taking any significant action. Coordination of the two projects could greatly affect desirability and cost of a proposed bike path.

#### **Disposition**

- The bike trail has been proposed but not planned to the point where it could be analyzed now. As proposed it would affect a far greater area than this project covers. The knowledge that the trail has been proposed will be included in the analysis and the alternatives considered will not foreclose the opportunity to go ahead with the trail in the future.

### **Forest Rotation, Early Successional Habitat, and Even-aged Management:**

#### **Comment:**

- The Scoping Document describes the last logging (Vegetation Management) as occurring from the mid 1980s to the early 1990s. This indicates a rotation of 10 to 15 years. The current and proposed Forest Plan turns sustained yield on its head by appealing to those whose main goal is the propagation of browsing wildlife (regenerating habitat and early successional species). This is a clever rationale for clearcutting (even age treatment) but not a way to sustain the forest as a forest. Please substantially increase this rotation and use honest descriptions for your proposed actions. . . .Please consider longer rotations.

#### **Disposition:**

- Vegetation management on the WMNF addresses the health and vigor of vegetation, wildlife habitat diversity needs, and also providing forest products through sustainable management. A main goal of the Forest Plan is not “propagation of browsing [for] wildlife”, but providing for wildlife habitat diversity. The “10 to 15 year” re-entry is not a “rotation”. We re-enter a project area and analyze the management needs and opportunities about every 15 years. The “rotation” age depends on the species type and when it matures. Rotation ages vary from 60 years for short lived species to 120 years for northern hardwood. Rotation ages, vegetation management for wildlife habitat diversity and strategies for sustained yield are forest plan issues. The vegetation management accomplished in the mid 80’s to early 90’s was planned at an earlier date. The treatments currently being planned for this project will be accomplished between 2005 and 2010. That is 15 to 20 years between treatments.

### **Early Successional Habitat:**

**Comment:**

- There is a need to increase the amount of 0-9 yr forest type
- I would support the project with the exception that additional clearcuts should be added to bring these HMUs closer to plan objectives.

**Disposition:**

- We developed an alternative and will look at the potential for more CC prescriptions based on FP criteria, and then evaluate this against visual considerations. This will determine whether this will be considered in detail or eliminated from further considerations. 0-9 is an age class not a forest type. Young growth or temporary opening habitat is only one of many forest goals. Growing quality saw timber, sustained yield and diversity over others. Most stands will be retained beyond the current rotation ages.

**Old Growth:****Comment:**

- There seems also to be a need for old growth, particularly at low elevation.

**Disposition:**

- Old growth goals are set at the Forest Plan level. The wildlife strategy in the WMNF Forest Plan ensures that all major habitat components are distributed across the landscape (USFS 1986a, Appendix B). Most of the forested habitat on the WMNF (approximately 400,000 acres) is not subject to vegetative management and is in the mature or over-mature age class. In addition, approximately 50% of forested habitat within actively managed areas (180,000 acres) is also designated in the mature or over-mature age class. In general, actively managed lands occur below 2,500 feet elevation. A ten-year review of the Forest Plan concluded that habitat conditions in the managed portion of the WMNF strongly favored species that prefer mature forests (USFS 1997). The Forest has only achieved about 50% of its desired goal for regeneration or young age classes of forested habitat and far exceeded its goal for over-mature habitat (USFS 1997). We currently have no information that leads us to believe that any of the wildlife species on the WMNF are dependent on old growth habitat. One study on the WMNF compared bird species composition in old growth northern hardwood stands versus managed northern hardwood stands and found no differences (Absalom 1988). An evaluation of WMNF MIS population trends and viability showed that most species were stable or increasing, except for species using early successional habitats (USFS 2000, 2001).

**Roads and Trails and Recreation Use:****Comment:**

- If any roads are made for this project, I ask that they be left in a condition that they can be used by mountain bikers and back country skiers. Also, although I am not a snowmobiler, I feel that snowmobilers should also have access to such possible new roads. Although one of the goals for MAS2.1 and 3.1 are to provide opportunities for recreation, no current need

was identified for the Project Area to increase recreation opportunities. However, closed roads can be used by bikers and x-country skiers.

**Disposition:**

- There is already a snowmobile trail within the project area. There is no goal to increase snowmobile trails in this area. Alternative considered but eliminated, because it does not meet Purpose & need.

**Request for Alternative:**

**Comment:**

- Supports roadless area rule and an alternative that considers not harvesting trees in portions of the project area that are roadless.

**Disposition:**

- Alternative will be analyzed in detail.

**Request Measures to prevent Chronic Wasting Disease:**

**Comment:**

- Avoid action which might tend to increase the deer population above the natural range of variability because of the potential of wasting disease

**Disposition:**

- There are no documented cases of Chronic Wasting Disease in NH or ME or VT to date. These State Wildlife management agencies are monitoring the deer harvested at hunter check stations and the NH State legislature has taken precautions and banned the importation of deer and elk byproducts into the state. The NH F&G Department manages the deer population throughout the state and they are careful that population numbers in this area do not exceed the carrying capacity of the habitat. Creating early successional habitat does not automatically equate to an increase in the deer population.

**Request to Use Light Equipment:**

**Comment:**

- Consider the advantages of light equipment such as mini-skidder and forwarder (Northern Woodlands / Summer 2004 page 34) Include this as mitigation where appropriate.

**Disposition:**

- Use of such equipment would require more frequent trips by equipment that is inadequate to haul hardwood logs resulting in more trips and potentially more impacts.

**Request to Consider Scenic Resources:**

**Comment:**

- I have just finished reading about this proposal. My only concern would be under the mitigation measures section item six. I think this sensitivity is very important in a project of this scope and size.

**Disposition:**

- Mitigation concerning view from Cannon Mt. is already part of the Proposed Action.

**Request for Map With Elevation of Proposed Cuts:**

**Comment:**

- In the EA please provide a map showing elevations of proposed cuts and their relation to 6.2 areas and previous cuts. This is necessary to understand diversity with respect to elevation, stand composition and age.

**Disposition:**

- The EA map will include topographic lines to show elevations of stands.

**Request to Buffer Hiking Trails:**

**Comment:**

- Please consider buffering hiking trails with a wide no cut zone.
- Requesting that USFS visually protect Skookumchuck Trail

**Disposition:**

- The Skookumchuck Hiking Trail will be buffered by a 10 foot wide no cut zone and there will be no clearcut units proposed here.

**Request to Avoid Harming Squirrel Corn:**

**Comment:**

- Squirrel Corn is found in project area and to avoid harming plant populations.
- Squirrel Corn: This species grows on talus slopes and in mesic forests, and the primary threat to it would be the removal of trees through logging or development.

**Disposition:**

- No clearcutting and harvest in winter.

**Request to Protect Black-backed Woodpecker:**

**Comment:**

- Black-backed Woodpecker needs to be protected:

**Disposition:**

- The Black-backed Woodpecker is not on the Regional Forester's Sensitive Species list; however it is on the NH State threatened list. The Project Area contains no suitable habitat such as a black spruce component and no black-backed woodpeckers were seen during ongoing field reviews of the Project Area. The potential effects of the Proposed Action or Alternatives will be analyzed in the EA.

**Request to Define Genetically Resistant Beech Trees:**

**Comment:**

- The Scoping Document indicates that beech trees will not be protected in a clear-cut (regeneration unit) unless they are genetically resistant to scale complex, protected and buffered with a group of other leaf (what does this mean?) trees. All beech trees should be protected.. Provide an explanation of what constitutes a resistant tree and when and why these trees would be left.

**Disposition:**

- Essentially these are trees thought to be somewhat resistant to the beech scale nectria complex.

**Request to consider Snowmobile trail in Project Area:**

**Comment:**

- We, the New Hampshire Snowmobile Association support the idea of forest management and believe that this will help the growth of the forest, plants and animals. The roads that the skidders use to haul logs out we use for our trails. The only wish that New Hampshire Snowmobile Association has is that we would still like the cooperation of the US Forest on any logging areas so we can put up signs and any detours can be signed ahead too. If you could contact any local club or the New Hampshire Snowmobile Association concerning this, it would be greatly appreciated.

**Disposition:**

- Careful coordination with local snowmobile clubs and the NH Trails Bureau will be conducted prior to any potential harvesting and safety issues mitigated through the use of warning signs.

**Request for Information on Economics:**

**Comments:**

- How much does the economic viability of local communities depend on timber harvest compared with recreation and with the many hard to quantify values of environmental services such as carbon sequestration?

**Disposition:**

- Analysis – Projects such as Sugar House are done for resource considerations, such as providing wildlife habitat diversity and maintaining a sustainable flow of forest products on lands designated for these purposes. Any economic benefits contributed to the local economies from production of forest products or recreation are secondary to the primary purpose of implementing the Forest Plan. A section on economics will be included in the EA.

### **Request for Information on Road Standards:**

#### **Comment:**

- Logging roads in the area should be maintained to the lowest standard. I hope that "provide motorized recreation opportunities" will be separately scoped if it represents a new proposal.

#### **Disposition:**

- Roads will be maintained at the current standard they are now. Although one of the goals for MAs 2.1 and 3.1 are to provide opportunities for recreation, no current need was identified for the Project Area to increase recreation opportunities.

### **Request for Information:**

#### **Comment:**

- Please explain "...need to harvest growth to regenerate stands to maintain a sustainable forest". (page 6 line 2. Until almost 1900 the forest regenerated and sustained itself. In some areas very high volumes of good spruce are documented. (Cedar Brook in the East branch area for example. Is the project area not naturally capable of growing the hardwood you want? Does the area have a better natural capability of growing mostly spruce-fir? What is the status of the area in relation to the natural range of vulnerability?

#### **Disposition:**

- Yes, the forest is capable of "sustaining" itself without intervention. However, for MA 2.1 and 3.1 lands, the Forest Plan has determined that one goal is to provide forest products on a sustained yield basis through intensive management. The Forest Plan also recognizes that, in these MAs, this goal is also compatible with the goals of providing wildlife habitat diversity and recreation opportunities for lands with either roaded natural or semi-primitive recreation designations.

### **Request for Information on why we have hardened bike paths and snowmobile trails in Roadless Areas:**

#### **Comment:**

- The Scoping Document lacks any specificity regarding the proposed actions or lack of actions in the inventoried roadless area. I am amazed that the roadless area contains a

snowmobile trail, a hardened bike path and much of your proposed logging. Were the snowmobile trail and hardened bike trail created subsequent to the original (pre-2003) roadless area designation? Do you propose performing your extensive logging in this area without any road

**Disposition:**

- These trails were in place well prior to the so called 2003 Roadless Rule and the 2003 Roadless Rule identified “inventoried roadless areas” for the purpose of Forest Planning, and that this is not a “roadless designation”. Vegetation management proposed in this project in this inventoried roadless area would not exceed the thresholds for an inventoried roadless area, and there are no additional roads being proposed as part of the Proposed Action.

**Request for Information on Forest roads 180, 181, 182:**

**Comment:**

- Forest Roads 180, 181 and 182 are not shown on your map. Where, exactly, are they and what is their present condition? What are the exact proposed “maintenance” activities for these roads. FR 182 shows on the map, but FR 180 and FR 181 do not. Provide a map that show where these roads are and explain their existing condition and what constitutes “road maintenance”.

**Disposition:**

- The EA Map will show where these roads are. Essentially they are sections of old Route 3 that were abandoned once new Route 3 was constructed. They will be maintained to prevent resource damage but at a minimum level and will not be open to public motorized vehicles.

**Request for Information on Invasive Plants:**

**Comment:**

- Item #8 on page 13 of the Scoping Document refers to weeds. What particular species of plants would be on the Forest Service list of weeds? Invasive species, certainly, but what others?

**Disposition:**

- The weeds referred to are indeed those considered “noxious weeds” such as Spotted Knapweed, Japanese Knotweed, and Purple Loosestrife amongst others. The Forest Service is working hard to keep the forest free of invasive plants by a program of early detection and eradication.

**Request for Information on Contract Administration:**

**Comment:**

- How are cutting contracts given out? What supervision is given. I have seen places where single tree selection has been done, where major damage has been done to other trees by skidders. I realize this happens to some extent, but these trees that are barked should be removed as they are permanently damaged. Also as always I'm for leaving some brush in piles as homes for wildlife.

**Disposition:**

- Contracts are given out according to national standards and normally go to the highest bidder and after a bond is posted for operating in a cutting unit. Forest Service contract administrators are specially trained and certified specialists who monitor timber harvesting to detailed contract specifications.
- No whole tree harvesting would occur, therefore, ample amounts of tree tops are left on site thus providing some escape cover. Although snowshoe hare may use brush piles, they prefer an interspersed cover of dense shrubby cover for browse and especially dense regenerating and sapling coniferous cover for protection from both terrestrial and avian predation.

**APPENDIX D – Mitigation Measures**

In addition to the applicable Forest-wide and Management Area standards and guidelines listed in the Forest Plan (pages III-5 through III-29 and III-36 through III-41). The following specific mitigation would be applied to all action alternatives.

**Vegetation**

- To ensure that early-successional species are present in mature hardwood stands for wildlife, a component of mature aspen, paper birch, and softwood would be reserved. For paper birch, 2 or 3 mature or over mature trees would be reserved per acre. For aspen, 2 or 3 mature or over mature trees would be reserved per acre and for softwoods, reserve small inclusions of 2 or 3 trees per acre.
- Beech trees genetically resistant to scale complex would be reserved from harvest.
- Only individual tree selection would be allowed in the portion of stand where squirrel corn has been identified.
- Winter harvest only in areas where squirrel corn was found during surveys.
- The sale administrator will lay out or approve main skid trails through the stands before harvesting begins. This will reduce the area affected by skid trails in the stand, thereby reducing the number of trees damaged.

**Visual Quality**

- From the edge of Route 3 all slash from purchasers operations would be removed for a distance of 50' and lopped to within 3' of the ground for another 50'.
- From the edge of the Skookumchuck Hiking Trail and the Snowmobile Corridor Trail all slash

from harvesting operations would be removed a distance of 25' and lopped to within 3' of the ground for another 25'.

- Retain a 10 foot wide no cut buffer on both sides of the Skookumchuck Trail so that no stumps would be visible in this 20 foot wide zone. This zone would extend for the entire seven hundred foot section of the Skookumchuck Trail that is proximate to proposed harvesting. From 10 to 30 feet beyond the trail there would be a higher percentage of residual basal area (tree stems) left. This will create a more natural appearance and transition along the trail corridor.
- Unit 5 is a proposed Overstory removal treatment. A visual buffer would be established along Route 3 to minimize a prolonged view of a treatment stand.
- The single tree selection prescription adjacent to the Mount Cleveland Wayside area would consider views from the wayside and focus on removing trees that impede quality views from the wayside.
- The Overstory removal proposed in stand 35 would include the on the ground coordination with the WMNF Landscape Architect and the NH DOT representative. Small saplings would be eliminated along the edge of Route 3 from impeding views created by the overstory removal. The size of the overstory removal would be limited to 16 total acres of which 1/3 of this area is already advanced regeneration and would not be harvested.

## **Water**

- Any harvesting within 100 feet of a perennial stream will maintain at least 70% crown closure (SPNHF 1997).
- Trees adjacent to the channel will be retained to provide structure and stability and stream crossings will be in designated locations.
- Trees will be felled directionally away from streams where possible.
- The timber sale contract will contain clauses entitled "Prevention of Oil Spills, CT 6.341", "Sanitation and Servicing CT 6.34", and Hazardous Substances CT 6.342, requiring the timber purchaser to take preventive measures to ensure that any spill of petroleum products does not enter any stream.
- Main skid trails will be located on slopes 40 percent or less.
- Watershed protection measures such as waterbars and sediment control will be maintained as considered necessary until no longer needed.
- Stream crossings will be restored, as needed using shaping, matting, seeding, or other effective methods to restore stream morphology and function.
- Install stream-crossing structures at right angles to the stream channel in straight sections.

## **Fisheries**

- Within stream channels that support brook trout, bridge and culvert and bridge installations that have the potential to disturb soils would be installed during the period of May 1 to September 180, 181, and 182 to protect spawning and egg rearing habitat.

## **Wildlife**

- During the raptor nesting season, avoid harvesting activities within 0.25 miles of known, active raptor nests. Maintain an uncut buffer of at least 66 feet around known raptor nest trees and retain 65-85% canopy closure within 165 feet of any nest (Flatebo 1999).
- Beech trees with an abundance of bear claw marks should not be marked for cutting unless the tree is expected to die in the near future. Exceptions may include hazardous trees or parts of skid trails or landings that cannot be moved because of land features. Another exception would be in regeneration harvests designed to create optimum conditions for the regeneration of paper birch, aspen or softwoods. In these instances, beech trees may be reserved to meet requirements for reserve patches or wildlife trees. In areas with heavy concentration of bear trees, patches of habitat will be reserved to minimize damage to the trees.

### **Heritage Resources**

- Project layout will insure avoidance of known cultural sites. Known sites will be flagged and placed on a map and made known to anyone working nearby.
- If, in the course of any project activities, previously unknown sites or artifacts are located, activities will stop immediately in that location. The district heritage paraprofessional and Forest archaeologist will be called in to evaluate the finds and make recommendations on how to proceed

Units adjacent to known cultural sites will be logged on frozen ground to help protect historic values associated with the sites.

### **Recreation**

- Minimize the number of skid trail crossings the Franconia Snowmobile Trail and the Skookumchuck Hiking Trail. Where skid trails do cross snowmobile trails, and logging may occur during the winter season, warning signs will be posted at the entrance to the affected section of trail, snowmobile speeds will be restricted to 10 mph approaching skid trail crossings, and stop sign will be installed at the skid trail, ski/snowmobile crossings. A stop sign/warning sign will be posted 250 ft prior to the skid trail crossing. Where trees are to be felled within 200 ft of an active trail the timber purchaser will post flag persons to control traffic and insure safety for the trail users.
- Signs will be posted at trail-heads to explain the possible interruption or modification of trail use. The objectives and benefits of the timber sale will be explained as part of that message.
- A signing plan will be developed that lists the conditions which require signs to be posted and shows the location where signs are to be posted. The plan will be covered in the pre-work meeting with the purchaser. The sale administrator will obtain the required signs and have them available for the purchaser to post as needed.
- Snowmobiles will be restricted from using the northern one mile of the bike path. Snowmobile use will be diverted to the existing bypass.
- In advance of the sale the Forest Service will coordinate with the State of New Hampshire Bureau of Trails installation of necessary signing and trail maintenance on the by pass.
- Trails will be kept free of slash during and after sale operations as a safety precaution.
- A temporary gate will be installed at the entrance of the bike path in the Skookumchuck Trail head to preclude visitors from driving the bike path.
- Do Not Block Gate signs will be installed in the Skookumchuck Trail Head.
- No trees will be cut in the tread way of the Skookumchuck Trail.

- A ten foot uncut buffer will be left on both sides of the Skookumchuck Trail for the seven hundred linear feet affected by the proposed timber harvesting.

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## APPENDIX F – Glossary

**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.

**Ecological Land Type (ELT)** - An area of land with a distinct combination of natural, physical, chemical, and biological properties that cause it to respond in a predictable and relatively uniform manner to the application of given management practices. In a relatively undisturbed state and/or at a given stage (sere) of plant succession, an ELT is usually occupied by a predictable and relatively uniform plant community. Typical size generally is several hundred acres.

**Ecological Land Type Phase** - These are subdivisions of those ELTs where vegetation management is most common. They share the same characteristics as ELTs; however, their size is smaller (10-100 acres) and the biological and physical conditions are more limited. They are locally known as Forest Habitat Types.

**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.

**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 within 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.

**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.

**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 within a given climatic mineralogical zone and supporting a distinct successional sequence of vegetation growing on a unique type of soil material.

**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.

**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.

**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 reconstruction** – upgrading a road to a different use level such as from winter use to summer use road.

**Road restoration** - 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.

**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.

**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 within 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.

**Visual Quality Objectives** - A desired level of scenic quality. Refers to the acceptable degree of alteration of the characteristic landscape:

**Preservation** - A visual quality objective that provides for ecological change only.

**Retention** - A visual quality objective that means that management activities are not evident to the casual Forest Visitor.

**Partial Retention** - A visual quality objective that means management activities may be evident but must remain subordinate to the characteristic landscape.

**Modification** - A visual quality objective that means that management activities may dominate the characteristic landscape but must, at the same time, utilize naturally established form, line, color, and texture.

**Volume** - The measure of quantity forest products (sawtimber, pulpwood, and chipwood).

**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.