

# White Mountain National Forest



United States  
Department  
of  
Agriculture

Forest  
Service

Eastern  
Region



## Loon Mountain South Peak Learning Center Project

Town of Lincoln  
Grafton County, NH

## Environmental Assessment

April, 2014



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# 1 Introduction

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## 1.1 Document Structure

The USDA Forest Service has prepared this Environmental Assessment (EA) in response to CLP Loon Mountain, LLC's (Loon Mountain) proposal for the South Peak Learning Center Project in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This EA discloses the analysis for the direct, indirect, and cumulative environmental effects that may result from the Proposed Action and alternatives. The document is organized into six chapters to support the analysis.

1. *Introduction:* This chapter includes information on the history of the project proposal, the Purpose of and Need for the project, and information on how the Forest Service will make a decision. This chapter also details the public involvement process for the Loon Mountain South Peak Learning Center Project.
2. *Description of Alternatives and Analysis of Issues:* This chapter provides a description of the Proposed Action which was developed to specifically address and respond to the Purpose and Need for the project. This chapter also introduces the issues for analysis identified during public involvement and discussion among the Forest Service Interdisciplinary (ID) team.
3. *Existing Conditions and Environmental Effects:* This chapter is organized into sections by resource. Each section begins with the issue statement(s) that tie the resource to the respective issue(s) identified from public comments and by resource specialists. The existing conditions of the resource are described as they relate to the effects analysis. Finally, the direct, indirect, and cumulative effects of the implementation of the alternatives are disclosed.
4. *Consultation and Coordination:* This chapter provides a list of Forest Service staff that assisted in the preparation of the EA, as well as other agencies, organizations or individuals consulted during its development.

5. *References*: This chapter provides a list of reference material cited in the environmental assessment.
6. *Abbreviations and Acronyms*: This chapter provides a list of abbreviations and acronyms used in the Loon Mountain South Peak Learning Center Project Environmental Assessment.

Additional documentation may be found in the Loon Mountain South Peak Learning Center Project file located at the White Mountain National Forest (WMNF) Androscoggin Ranger District, New Hampshire (NH).

## **1.2 Project Introduction**

The WMNF is proposing to authorize Loon Mountain to implement the South Peak Learning Center Project (the Project), located in part on National Forest System (NFS) lands on the South Peak area of Loon Mountain's Special Use Permit (SUP) area. The project as proposed would construct new ski and snowboard trails and two chairlifts as part of a ski and snowboard Learning Center expansion project on Loon Mountain's South Peak area. The proposed new Learning Center would include the construction of two fixed-grip quad chairlifts, two Magic Carpet® conveyor surface lifts and approximately 13 ski trails comprising 18.7 acres of new and 6.6 acres of existing beginner/learner terrain with associated snowmaking and snowmaking lines. In addition, Loon Mountain would construct a 6,000 square foot base lodge, entirely on private land, near the existing overflow parking area. Clearing for lift corridors would total an additional 3.1 acres (see Figure 1.3-3).

As proposed, the South Peak Learning Center project area lies in part on National Forest System (NFS) lands and in part on non-NFS lands.

Approximately 60% of one of the chairlifts and 35% of the second would be located on NFS lands. Approximately 60% of the proposed trails would also be on NFS lands. The remainder of the trails, chair lifts, surface lifts and base lodge would be on private lands. While not directly part of Forest Service decision-making jurisdiction, the portion of the project on private lands is considered a connected action, because without Forest Service approval of the proposed actions on NFS lands, actions as proposed on private lands would not occur.

Accordingly, this document presents the impact of the proposed Project on both NFS and private lands. The trail *Escape Route*, presently used by skiers who parked in overflow parking in the South Mountain area and are leaving the resort for the day, would remain largely separate from the learner area (See Figure 1.3-3).

The portion of the proposed Learning Center project area that would be on NFS lands would occur within the existing SUP area to the southwest of the Pemigewasset Base Camp area. These NFS lands are designated in the White Mountain National Forest Land and Resource Management Plan (Forest Plan) as Management Area (MA) 7.1, Alpine Ski Areas (USDA-Forest Service 2005a). The proposed action is consistent with the 1999 Loon Mountain Master Development Plan (MDP), as amended (Sno.engineering [now SE Group] 2000).

### **1.3 Project Area**

Loon Mountain is located in Lincoln, New Hampshire, off Interstate 93 at Exit 32, on the western end of the scenic Kancamagus Highway (Route 112) in Grafton County, Town of Lincoln, New Hampshire (Figure 1.3-1). Loon Mountain is a four-season resort operated by Loon Mountain Recreation Corporation (Loon Mountain) primarily on NFS lands on the Pemigewasset Ranger District in the WMNF. Loon Mountain is a wholly-owned subsidiary of CLP Loon Mountain, LLC, which operates on NFS lands under the authority of a SUP issued by the Forest Service and administered by the WMNF. The SUP authorizes use of 1,366 acres of NFS lands for alpine skiing areas at Loon Mountain (Figure 1.3-2). Loon Mountain has operated under a SUP since 1965; the current SUP was issued in 2014 and expires in 2054.

The SUP authorizes the permit holder to provide four-season, developed recreation opportunities to the public on NFS lands. While the Forest Service oversees the management of the NFS lands and resources associated with the ski area, the improvements, including lifts, lodges, snowmaking systems, etc., are owned and operated by the permit holder. The cost of construction (and removal, when necessary) of these facilities is the responsibility of the permit holder as are all operating expenses, environmental analyses and environmental

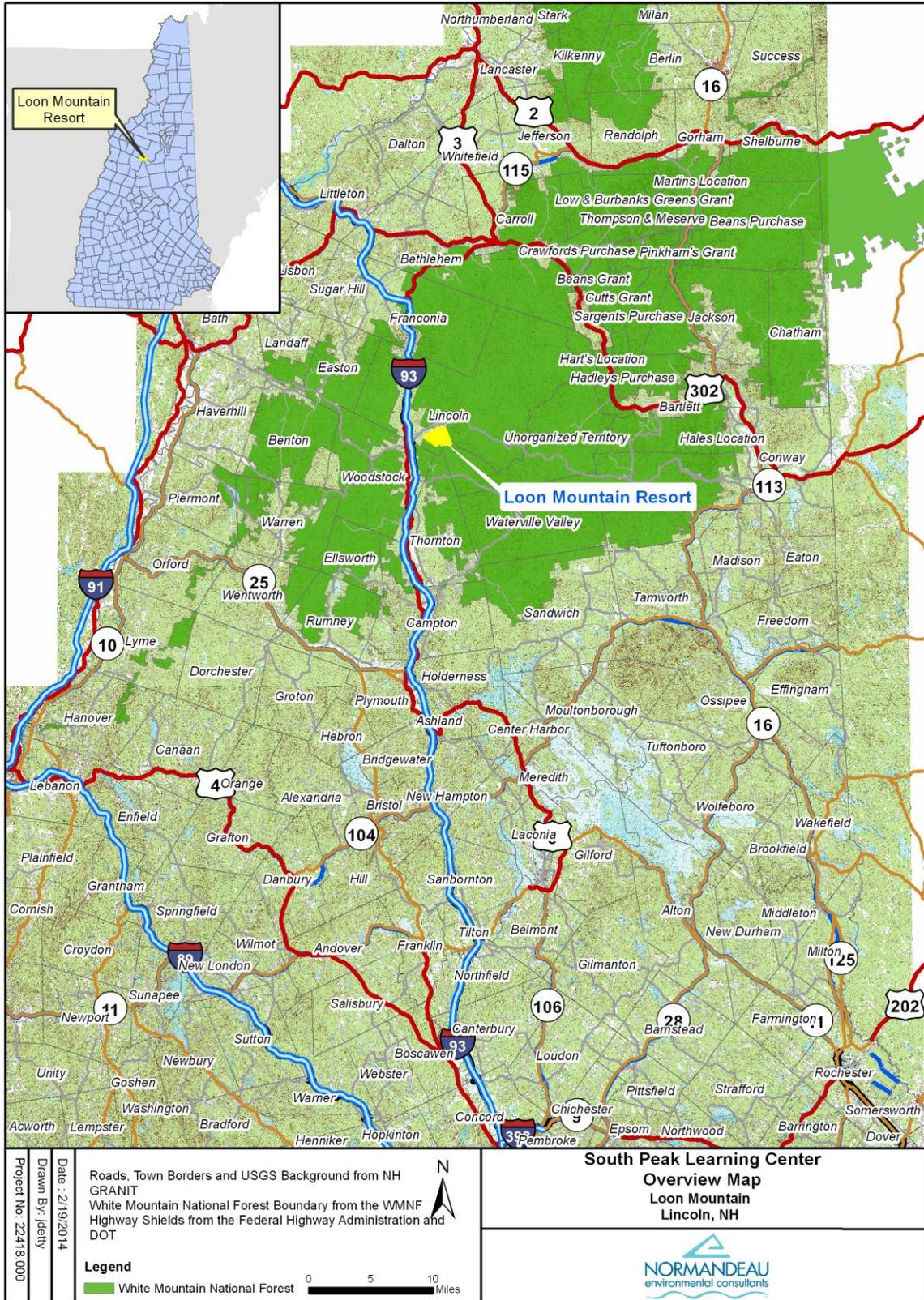
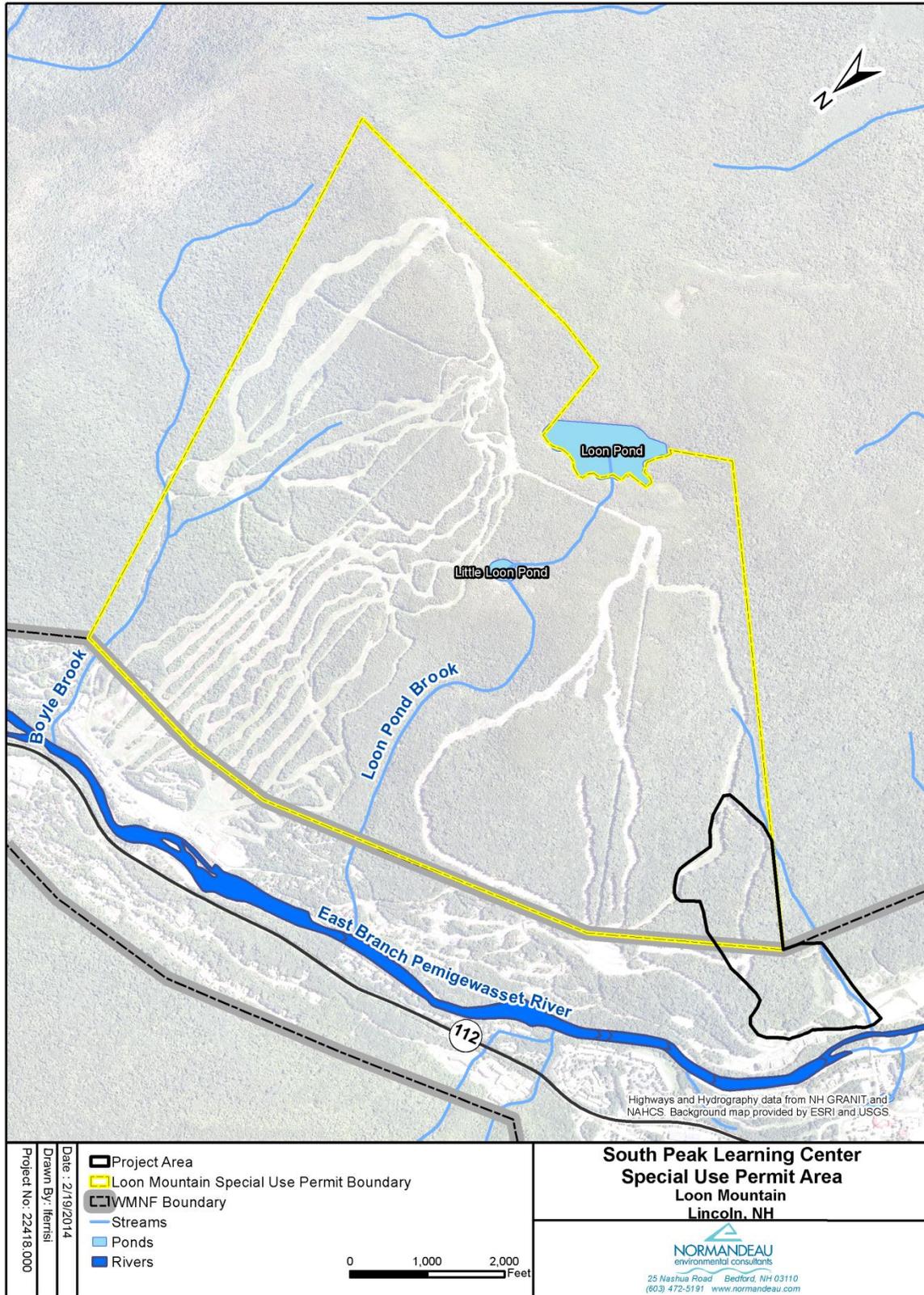


Figure 1.3-1. Loon Mountain Ski Resort Location Map.

Loon Mountain Ski Resort South Peak Learning Center Project



**Figure 1.3-2 Loon Mountain Special Use Permit and Proposed Project Area**

protection measures. In addition, the permit holder pays user fees to the U.S. Government; these fees are based on the holder's business receipts. This proposal and its analysis are funded by the permit holder, irrespective of the outcome of the Responsible Official's decision.

There are approximately 370 skiable acres at the resort that encompass 61 maintained trails, seven gladed areas and seven terrain parks including a 425-foot superpipe and a mini-pipe. With the exception of the deficiencies discussed below, the trail and terrain network accommodates a range of ability levels from beginner to expert for both skiers and riders.

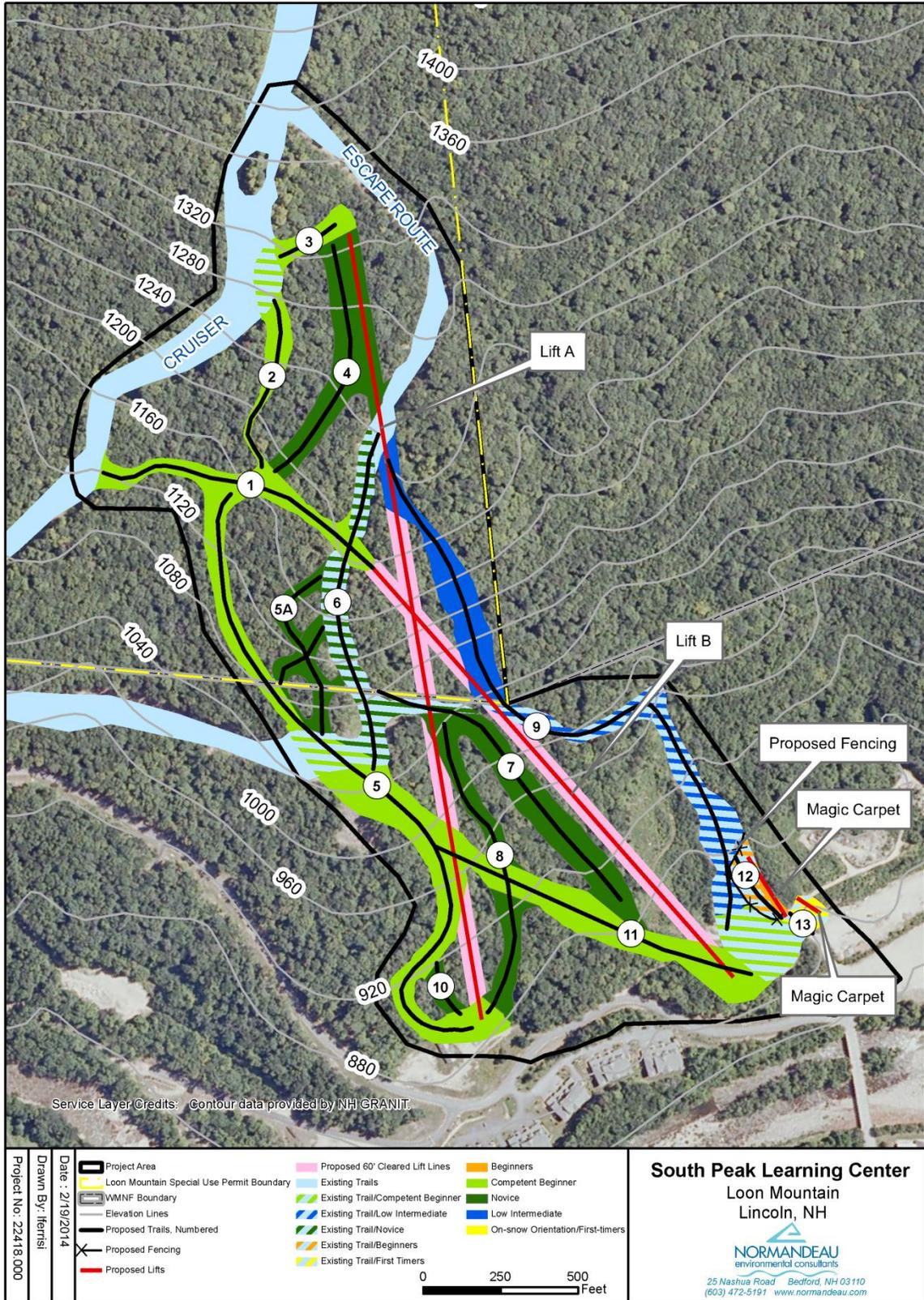
**Project Area:** For the purpose of analyzing the potential environmental effects of the proposed action and the alternatives, and the development of this document, the South Peak Learning Center project area (project area) has been defined as a subset of those specific lands operated by Loon Mountain within its SUP area and abutting private land where project activities are proposed (Figure 1.3-3). The project area is approximately 77.5 acres and encompasses a majority of the potential direct and indirect effects to resources. Each resource analyzed in Chapter 3 identifies the specific analysis area for that resource.

## **1.4 Forest Service Authority, Policy and Management Direction**

The enabling authorities of the Forest Service derive from many laws enacted by Congress and the regulations and administrative directives that implement these laws, as described in numerous Forest Service documents and on the USDA-Forest Service website (<http://www.fs.fed.us>). The National Environmental Policy Act (NEPA) requires federal agencies to systematically evaluate and document the environmental and social impacts of all federal actions.

Compliance with NEPA at the project level involves environmental analysis of a specific proposal to implement the Forest Plan. It includes the disclosure of environmental effects of proposed activities and alternatives, public participation, analysis of alternatives and preparation of a decision document that provides specific direction for project implementation if an action alternative is selected by the decision maker.

Loon Mountain Ski Resort South Peak Learning Center Project



**Figure 1.3-3. South Peak Learning Center Project Area.**

## Environmental Assessment

The Loon Mountain South Peak Learning Center Project is designed to achieve recreation resource benefits and work towards Desired Conditions as established in the Forest Plan (USDA-Forest Service 2005a). As noted in the Forest Plan Goals and Objectives (Chapter 1, Forest Plan), a goal for the Forest is to “maintain and provide quality alpine skiing and related opportunities on the Forest through partnerships with the private sector.” Objectives to meet this goal include allowing Loon Mountain to continue to be operated by the private sector under SUP authority, consistent with permit language and the Forest Plan (Forest Plan, p. 1-4).

The Proposed Action includes activities that work towards meeting the Forest Plan Recreation Goals and Objectives of:

- providing a range of quality recreation activities and opportunities. (Forest Plan p. 1-10); and,
- working with the private sector through Special Use Permits to provide recreation opportunities (areas, facilities, services, and events) that the Forest Service alone is not able to offer, and that are consistent with the Desired Condition (DC). (Forest Plan, p. 1-15).

The Forest Plan allocates the Forest among Management Areas (MAs) and identifies a purpose, desired condition of the land, and standards and guidelines (S&Gs) for each of these MAs. The purpose and desired condition for each MA describe the role of the MA in moving the Forest toward the Forest-wide goals. Management Area standards and guidelines are defined the same way as their Forest-wide counterparts, except that they apply only to land allocated to a specific MA. If there is no direction specific to an MA for a resource, there is a reminder that Forest-wide standards and guidelines still apply, which is true for all resources (Forest Plan Preface p. iv).

The portion of the proposed action that is located on NFS lands is entirely within Management Area (MA) 7.1, Alpine Ski Areas (USDA-Forest Service 2005a). The major emphasis of MA 7.1 is to provide alpine winter sports and year-round recreational opportunities at alpine ski areas on the Forest managed by the

private sector under Special Use Permit authority. The Desired Condition of MA 7.1 is:

*“These areas will be highly developed... Large numbers of users may be present, sights and sounds of human activity will be readily evident, and the interaction between users will be moderate to high. Facilities are designed for use by a large number of people. Facilities including parking lots, structures, and utilities will be evident, and are designed to be compatible with the values that make the area attractive to the users. Management and operating practices are aimed at enhancing permitted recreation activities at the area while protecting the natural resources and visual characteristics.” (Forest Plan, p. 3-31)*

The standards and guidelines for MA 7.1 include all Forest-wide standards and guidelines, with a few exceptions specific to this MA are discussed within each resource analysis section in Chapter 3. This proposed project would be designed to be consistent with all applicable Forest-wide and MA 7.1 goals, objectives, standards and guidelines, as outlined in the Forest Plan.

## **1.5 Purpose and Need for the Proposed Action**

Loon Mountain has a notable and worsening overcrowding problem on its existing beginner/learning terrain. Limited to only 8.8 acres, this terrain is easily overwhelmed by users even on moderately busy days, especially on the trail *Sarsaparilla* which is the only true, first time, beginner teaching terrain and is limited to 1.7 acres. Although the 2000 Loon Master Development Plan indicates that Beginner/Novice terrain is only slightly less than what was viewed at the time as ideal for the resort, most of that acreage (49.4 acres) is novice or competent beginner terrain which is not suitable for first time beginner teaching terrain, especially using today’s teaching methods. Loon Mountain’s existing terrain breakdown is shown in Table 1.5-1.

**Table 1.5-1. Existing (Permitted) Terrain Ability Breakdown**

Ability Level	Existing (Permitted)	
	Acres	% of Total Terrain
Beginner/Novice	58.2	15
<i>Beginner*</i>	8.8	2
<i>Novice**</i>	49.4	13
Low Int./Intermediate	195.9	51
Advanced/Expert	128.2	34
<b>Total</b>	<b>382.3</b>	<b>100</b>
*Includes first timer and beginner		
**Includes competent beginner and novice		

Over the past several ski seasons, Loon Mountain has identified five primary needs for change in winter operations at its resort. This proposed action addresses those needs by:

1. Responding to demonstrated demand for additional beginner/learner terrain. Loon Mountain attracts a high percentage of beginner and novice skiers and demand by this user group is increasing. Ski school data for the past four seasons (between 2009/10 and 2012/13) confirms these increasing trends. During this time period:
  - Annual Level 1–3 (first-time beginner through novice) ski school lessons increased by 19.6% (from 5,754 to 6,879).
  - Total annual ski school lessons increased by 19.3% (from 8,132 to 9,700).
  - Approximately 56.3% of Loon Mountain’s total ski school business was composed of first-time skiers and snowboarders.
  - 77.3% of Loon Mountain’s total ski school business was Level 1-3 (first-time beginner through novice) skiers and snowboarders.

Because Loon’s beginner/learner visitation is relatively high and is increasing, the existing Learning Center, located near the Governor Adams’ Lodge base area, has notable and worsening overcrowding problems on its first-timer (0-8% slope), beginner (9-12%), and competent beginner (13-20%) terrain. At just 8.8 acres (1.7 acres of which is suitable

for first-timers), this limited teaching terrain is quickly overwhelmed by users, even on moderately busy days. A photo of a typical day at the Sarsaparilla teaching and learning area is provided on the cover of this document. This overcrowding compromises both the quality of the skier/boarder experience as well as skier/boarder safety.

Furthermore, nearly half of Loon's novice terrain (e.g., *Exodus*, *Upper Bear Claw*, *Grand Junction*, *The Link*, and *Brookway*) is also regularly used by more advanced skiers/snowboarders for circulation and egress. This mixing of ability levels on novice terrain compromises safety, functionality of the ski school and the guest experience.

2. Providing learner progression terrain that allows learning skiers and boarders to develop basic skills. The ski industry has long recognized the need to bring new skiers to the sport, especially in light of an aging "baby boomer" population, the group that built the industry to its current state. The National Ski Area Association (NSAA) in particular has been actively developing a "Model for Growth" and reporting its results and growth concepts to its member ski areas (NSAA 2009). The NSAA model focuses on "conversion", i.e., converting first-time skiers into long-term participants. There are many factors that may lead to increasing skier conversion, among the most influential of which is improving the learning experience of first-time skiers and other early-stage learners. In order to provide a fun and effective learning experience, it is critical that a resort provide beginners/learners with a progression of terrain for each step of the learning process.
3. Keeping current with evolving teaching methodology. Teaching methods and expectations are changing across the ski industry. Loon Mountain's ski school data shows that there is a growing expectation from beginner skiers and riders for all day, intensive lessons that accelerate the development of skills for beginners to successfully negotiate more difficult terrain. These lessons are either one-on-one or in very small groups that allow for more time spent actively skiing/riding and, accordingly, require more terrain than do the more traditional large group, short duration

lessons in which students spend most of their time watching rather than skiing/riding. Instructors at Loon Mountain have found that intensive training on low gradient terrain achieves faster results and a more positive experience for beginners.

4. Providing access to the mountain at South Peak. South Peak parking area does not have lift access portal to the main mountain. Although two intermediate trails (*Cruiser* and *Escape Route*) lead back to this area from higher on the mountain, there are no lifts from the South Peak parking area. Therefore, all guests who park there must ride a shuttle to other portals, and while intermediate and advanced level guests can exit the resort back to their vehicles, beginners must be shuttled back. This negatively impacts the user experience at Loon Mountain.
5. Accommodating snowboarding beginner lessons. Many of today's beginners are snowboarders rather than traditional skiers. It is a widely accepted fact that snowboarders require more learning space than skiers. Loon Mountain's limited (8.8 acres) beginner and mixed-ability use of novice and competent beginner terrain restricts its ability to meet snowboarders' needs.

To address these deficiencies, Loon Mountain is proposing to develop a dedicated Learner Center in the South Peak area of the resort to better accommodate the important and growing beginner/learner group of skiers/boarders. Part of this center would be on NFS lands within the resort's existing SUP.

The proposed action would also provide a new, full service portal at South Peak. As noted above, South Peak presently provides needed parking, but users must shuttle to other entry portals. A full service South Peak portal would enhance the experience of those users parking at South Peak and would speed and improve service to all of Loon Mountain's users by reducing early morning crowding at other Loon Mountain portals.

## 1.6 Decision Framework

The primary decision to be made by the Responsible Official is whether to authorize the Proposed Action, an alternative to the Proposed Action, if any, or the “No-Action” alternative. The Responsible Official will review the Proposed Action, the alternative(s), and the anticipated effects of implementation as provided in this EA and supporting documentation. The Responsible Official will then select the alternative that best meets the Purpose and Need and addresses issues and concerns while keeping environmental effects to an acceptable level. Consideration will be given to how well each alternative meets Forest Plan goals and objectives.

Other decisions to be made include:

- If an action alternative is selected, what mitigation measures and monitoring should be required?
- Is a Forest Plan amendment necessary to implement the project?
- Is the information provided by the analysis sufficient to implement the proposed activities?
- Does the proposed action have a significant effect that would trigger a need to prepare an Environmental Impact Statement (EIS)?

The Responsible Official for the decision will be Thomas G. Wagner, Forest Supervisor for the White Mountain National Forest.

### *Actions under Other Agency Purview*

The proposed increase of skiable terrain, chairlifts, and base lodge and associated snowmaking would be accomplished via a combination of actions located on NFS and private lands. The direct and indirect effects of the proposed action and the cumulative effects of past, present and reasonably foreseeable actions in the analysis areas, whether related to the Proposed Action or not, will be included in this analysis. The Forest Service has primary regulatory jurisdiction over the Proposed Action. However other federal, state, and local agencies may have regulatory jurisdiction, including the NH Department of Environmental Services (NHDES), the US Army Corps of Engineers (USACOE), and the New Hampshire

Division of Historic Resources (NHDHR). Other government entities such as the NH Fish and Game Department (NHF&G) or the Town of Lincoln may choose to comment on the project. The Forest Service and the United States Fish and Wildlife Service (USFWS) have conducted informal discussions under the Endangered Species Act (ESA) regarding effects to the Federal-listed proposed endangered northern long-eared bat.

## **1.7 Public Involvement**

A Scoping Report for the Loon Mountain South Peak Learning Center Project was mailed to interested and/or potentially affected members of the public on July 31, 2013. An informational open house was held on Wednesday, August 21, 2013 at the Octagon Lodge at 60 Loon Mountain Road, Lincoln, New Hampshire from 4-7 pm. The public was invited to attend anytime during this period to ask questions of the Forest Service staff or their representatives, review maps of the proposed expansion, and leave verbal or written comments on the project. The public or other interested parties could also submit comments on the Project to the Forest Service via email, fax, or phone per directions provided in the Scoping Report. The scoping comment period was open from July 31, 2013 to August 31, 2013.

This project has been continually published in the WMNF Schedule of Proposed Actions (SOPA) since October 1, 2011. The Scoping Report and associated figures are posted and available for download on the WMNF website.

Seventeen comments were received from letters, telephone conversations, emails and the public meeting as a result of public scoping. Seven of these comments were submitted by one individual, four others were submitted by a second individual and two were submitted by another. The remaining four comments were submitted by individuals. A Scoping Content Analysis was prepared which recognizes all of the comments received and provides more information on specific comments and how they were categorized. This document is a part of the Project file.

## 2 Description of Alternatives and Issues for Analysis

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### 2.1 Introduction

This chapter provides a description of the Proposed Action which was developed to specifically address and respond to the Purpose and Need for the project and discusses alternatives that were considered but were not analyzed in detail. This chapter also introduces the issues for analysis identified during public involvement and discussion among the Forest Service ID Team and identifies resources that were not analyzed in detail due to lack of project effect on those particular resources.

### 2.2 Proposed Action and Alternatives

This section describes and compares the alternatives that have been considered for the Loon Mountain South Peak Learning Center Project. It presents alternatives in comparative form and defines the differences between them. This comparison provides a clear basis for choice by the Responsible Official to implement the alternative that best meets the Purpose and Need and addresses the issues identified through public involvement.

#### *Alternatives Considered for Detailed Analysis*

Based upon review of the scoping comments and input from the ID team, the Responsible Official decided that no additional action alternatives would be included for analysis in this EA because as detailed below, no issues were identified that could not be avoided, minimized or mitigated. Forest Service Handbook (FSH) guidance provides:

*When there are no unresolved conflicts concerning alternative uses of available resources (NEPA, section 102(2)(E)), the EA need only analyze the proposed action and proceed without consideration of additional alternatives. (36 CFR 220.7(b)(2)(i))*

The No-Action Alternative is provided as a standard to measure potential affects should the project not be implemented at Loon Mountain. Thus, the two alternatives that have been carried forward for detailed analysis are:

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- Alternative A: No-Action
- Alternative B: Proposed Action

### *Alternative A: No-Action*

The No-Action Alternative is used as a baseline to compare the environmental effects of the Proposed Action alternative. Under Alternative A, there would be no implementation of any of the management activities on NFS or private lands associated with the Proposed Action. We have arrived at this conclusion because the proposed actions on private lands are intimately and unavoidable connected to actions on public lands. Without action on NFS lands, part of the purpose and need of the project (i.e., providing an appropriate variety and acreage of dedicated learning terrain and creating viable and attractive access to the rest of the resort through a new South Peak, full-service portal), could not be met on private lands alone, which are confined to a narrow strip along the base of the ski area. Accordingly, Alternative A serves as a mechanism for analyzing the effects of no expanded terrain beyond that already approved, no construction of additional lifts and no construction of a new base lodge.

### *Alternative B: Proposed Action*

#### *Overview*

Under this alternative, the Forest Service would authorize Loon Mountain to implement the South Peak Learning Center Project to accommodate the beginner/learner group of skiers/boarders. Part of this center would be on NFS lands within the resort's existing SUP boundary area; the balance of the project, including portions of two chairlifts, several trails, two surface conveyors and a base lodge would all be located on non-NFS lands (Figure 1.3-3). As noted above, Forest Service jurisdiction is limited to actions on NFS lands, but because the Forest Service has concluded that the proposed actions on private lands are connected, this document presents the impact of the proposed project on both NFS and private lands.

The proposed action would comply with all applicable Forest Plan Standards and Guidelines. In addition, all constructed facilities would be designed to meet

the guidelines provided in Agricultural Handbook No. 617 which includes guidance on building design elements, tower colors and trail edge design. A discussion of the specific actions follows.

### *Lifts*

The proposed action includes two fixed-grip quad chairlifts that would start on private land in the South Peak base area and end on NFS lands:

Lift A would traverse about 1,100 feet on private land and then continue an additional 1,560 feet on NFS lands (~2,660 feet total) to near the junction of existing trails *Cruiser* and *Escape Route*. This lift would have a design capacity of 2,400 people-per-hour but it would likely operate at a lower rate. Vertical rise would be approximately 550 feet.

Lift B would traverse approximately 1,170 feet on private land and then continue an additional 630 feet on NFS land (1,800 feet total), ending about 1,100 feet downslope from the Lift A. This lift would also have a design capacity of 2,400 skiers and riders per hour and like Lift A would likely operate at a lower rate. Vertical rise would be approximately 350 feet.

Towers for both lifts would generally be about 40 feet in height which would maintain a relatively low profile for the lifts. Because of the cross-over of Lift A over Lift B near the upper end of Lift B, one or two towers for Lift A would likely be taller, but no more than 50 feet tall.

Clearing for lift lines would total about 3.1 acres: 54% or 1.7 acres would occur on private lands while the remaining 46% or 1.4 acres would be on NFS lands.

Loon Mountain's overall project also includes two Magic Carpet® conveyor surface lifts, but these would be located entirely on private lands and are outside of Forest Service jurisdiction. The base lodge would also be constructed on private lands.

### *Trails*

The South Peak Learning Center would encompass a total of approximately 25.3 acres of skiable terrain, 62% or about 15.7 acres on NFS lands and 38% or about 9.6 acres on private lands. New trail clearing would be approximately 18.7 acres

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because 6.6 acres of terrain already exist and would be incorporated into the proposed beginner/learner area. Approximately 52% of the new terrain (9.7 acres) would be on NFS lands and 48% (9.0 acres) would be on private lands.

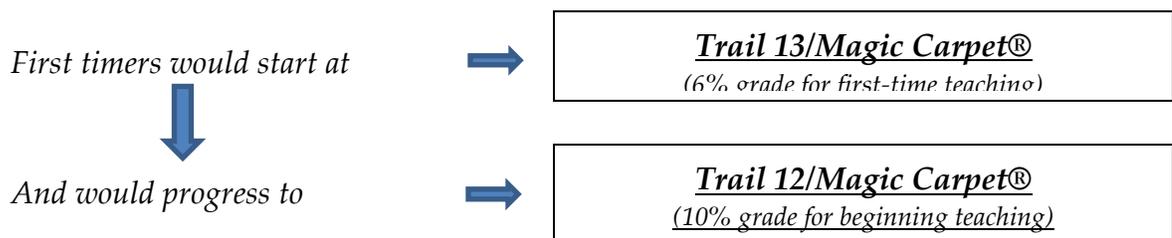
As provided in Table 2.2-1, proposed beginner/novice terrain additions would help shift Loon Mountain’s terrain breakdown to be more in line with the needs of the learner group.

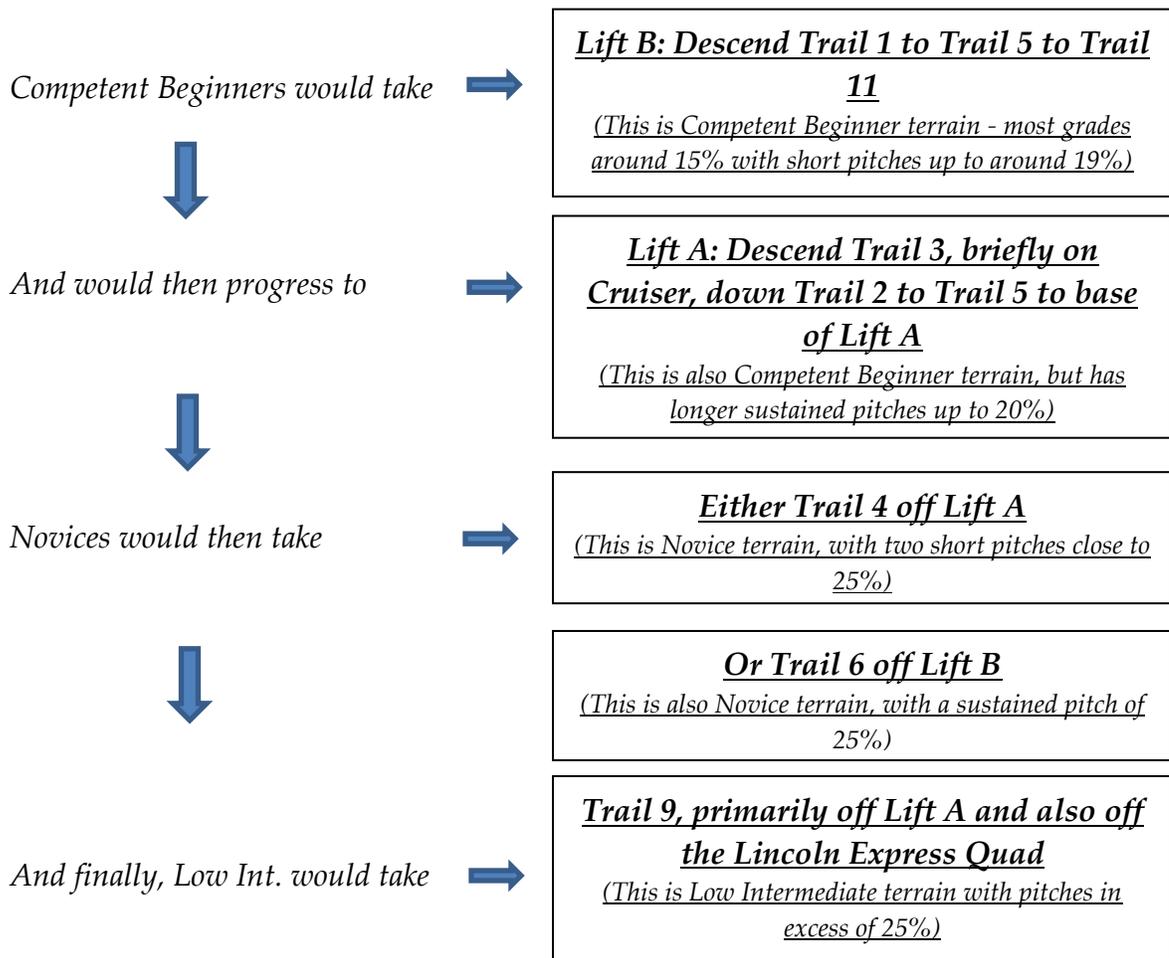
Trails on NFS land would be constructed in a manner consistent with relevant Forest Service standards and guidelines for ski trail construction. Construction of ski trails would require tree removal and grading to facilitate a consistent skiable surface and trail grooming. Merchantable trees would be removed from the site and sold per Forest Service rules and regulations. Tree tops, small trees and brush would be chipped on site and worked back into the soil.

**Table 2.2-1. Loon Mountain Terrain Ability Breakdown**

Ability Level	Existing (Permitted)		Proposed		
	Acres	% of total Terrain	New Acres	Total Acres	% of Total Terrain
Beginner/Novice (total)	58.2	15.2	17.4	75.6	18.9
<i>Beginner*</i>	8.8	2.3	0.8	9.6	2.4
<i>Novice**</i>	49.4	12.9	16.6	66.0	16.5
Low Int./Intermediate	195.9	51.2	1.3	197.2	49.2
Advanced/Expert	128.2	33.5	--	128.2	32.0
<b>Total</b>	<b>382.3</b>	<b>99.9</b>	<b>18.7***</b>	<b>401.0</b>	<b>100.1</b>
*Includes first timer and beginner **Includes competent beginner and novice ***An additional 6.6 acres of existing terrain would be incorporated into the proposed Learning Center terrain for a total of 25.3 acres.					

The terrain in Loon Mountain’s overall project would facilitate a strategic learning progression, as identified below. Trail numbers correspond to those shown in Figure 1.3-2.





### ***Snowmaking***

Snowmaking is proposed on all new terrain, requiring installation (generally aboveground) of approximately 5,000 feet of snowmaking pipeline on NFS lands and approximately 5,500 feet on private lands. There is currently about 3,000 feet (1,000 feet on NFS lands and 2,000 feet on private lands) on existing terrain that would be incorporated into the proposed Learning Center. Existing water supply sources (Boyle Brook, East Branch of the Pemigewasset, Connector Pond) are sufficient to meet the snowmaking demand (coverage, depth and completion dates) of the proposed terrain expansion. Snowmaking would be accomplished using energy efficient snowmaking technology. Snowmaking supply lines are already in place in the project area (*Escape Route*) so no new pump houses would be required. Loon Mountain has recently (November 2013) upgraded their water

withdrawal pumping capacity from 7,300 gallons per minute (gpm) to 10,500 gpm. This upgrade will provide a 44% increase in instantaneous snowmaking capacity which will easily accommodate the increased terrain at the proposed learning center while also improving snowmaking capacity resort-wide.

The water sources for snowmaking are not on NFS lands. Their use on Loon Mountain terrain was approved in the 2002 Loon Mountain Ski Resort Development and Expansion Final Environmental Impact Statement (FEIS) Record of Decision (ROD) (USDA-Forest Service 2002).

### *Alternatives Considered But Not Developed for Further Analysis*

Issues raised by the public during scoping or by the ID team during project review were not sufficiently substantive to warrant consideration of other action alternatives (see 2.3 below for a more complete discussion of issues).

Consequently, there were no “alternatives considered but not developed for complete analysis”.

## **2.3 Issues Identification**

Public scoping brought forth a number of ideas, suggestions and important information used in developing and analyzing this project. The ID team reviewed all public comments, identified the issues raised, and determined how they would be used in the analysis (see Scoping Content Analysis in the project file).

Issues that were identified as being outside the scope of the project or already decided by law or regulation were not used in the analysis. Three main issues were identified by the ID team and issue statements (listed below) were developed for these issues. The issue statements were derived from one or more comments received expressing concern on a particular topic.

The ID team evaluated these issues to determine if they could be addressed through the use of mitigation measures or in the effects analysis, or if an alternative would be needed to address any of them. As mentioned previously, all issues are addressed in the effects analysis.

*Traffic*

1. There is concern that the Proposed Action would result in traffic impacts in the nearby Westwood Acres area, a residential area adjacent to the permit area. Increased traffic could negatively affect quality of life, safety, and real estate values.

*Water*

1. There is concern over water availability for snowmaking, especially early in the season. There is concern that the proposed action will take water now used to open intermediate and more advanced terrain in the late fall/early winter to instead supply snowmaking needs on the new Learning Center trails.
2. There is a belief that expanded water use, just for beginner skiers, is not needed.

*Climate Change*

1. A commenter questioned the need for ski area growth, considering that climate change and resulting global warming may result in less snow in the future.

**2.4 Resources Not Analyzed in Detailed**

As discussed in Section 1.4, this site-specific Environmental Assessment (EA) has been designed to comply with the regulations established by the National Environmental Policy Act of 1969 (NEPA). Compliance with NEPA at the project level through an EA uses the environmental analysis process to disclose the environmental effects of the proposed activities and determine if an Environmental Impact Statement (EIS) is warranted. An EA is not intended to be a complete discussion of all potential environmental and human variables. Unlike an EIS which by NEPA regulation must be comprehensive, an EA is only required to “briefly” discuss the need for the Proposed Action, the alternatives, if any, and the environmental effects of the Proposed Action and its alternatives. All of the expected effects from this proposed project are consistent with, and within the range of, the expected effects disclosed in the Forest Plan EIS.

The following resources were considered during project development and at the start of the effects analysis, but have not been carried forward for further analysis in this EA for one or more of the following reasons: the Proposed Action will not affect them; the effects are so negligible that they are unable to be analyzed; the effects are within the expected range of operational effects of Loon Mountain as currently permitted; and there was no comment received from the public that would indicate concern over these resources.

- There are no known historic or cultural/heritage resources within the project area and none were observed during field inspection. No resources were observed within zones associated with the project area in numerous prior archeological surveys. (See the project file for a formal cultural/heritage resources site-survey.)
- Noise levels are anticipated to be consistent with the typical operational levels of a ski resort and, with the exception of temporary construction sounds during tree removal and chairlift installation, would not increase substantially beyond what currently occurs. The proposed expansion would not increase noise levels at any new sensitive noise receptors.

## **2.5 Comparison of Alternatives**

The Proposed Action and the No Action alternative differ by several factors. Table 2.5-1 displays and compares each alternative and summarizes the environmental effects of each alternative on various biological, physical, social and economic resources that are disclosed in more detail in Chapter 3.

**Table 2.5-1 Summary of Alternatives Analysis**

<b>Resource Area</b>	<b>Alternative A: No-Action</b>	<b>Alternative B: Proposed Action</b>
3.1. Water	No change to most water resources. No change to snowmaking withdrawal minimum flows.	No significant effect with implementation of Forest Service Standards and Guidelines; no change to snowmaking withdrawal minimum flows, but withdrawal, when water is available, would increase. The Proposed Action would not generally result in an increased peak rate of runoff; thus the potential for increased erosion or sedimentation is negligible. And because channel forming flows (i.e., flood flows) would not be affected appreciably, the potential for excessive scouring or channel/bed erosion is minimal.
3.2. Soils	No change	No significant effect with implementation of Forest Service Standards and Guidelines.
3.3. Fisheries and Aquatic	No change	No significant effect with implementation of Forest Service Standards and Guidelines; no change to snowmaking withdrawal minimum flows.
3.4. Vegetation and NNIS	Unlikely to increase the risk of existing NNIS spreading.	Conversion of 18.7 acres (9.7 acres of NFS land and 9.0 acres of private land) for ski trails and 3.1 acres for lifts (1.4 acres of NFS land and 1.7 acres of private land) of forest vegetation, replaced with vegetation typical of ski trails and lift lines; The low risk of NNIS introduction and spread is minimized through implementation of Forest Service Standards and Guidelines and control measures.
3.5. Wildlife	No direct, indirect, or cumulative effects to common wildlife, ecological indicators, or management indicator species. Habitat changes would occur through natural processes.	Conversion of 18.7 acres (9.7 acres of NFS land and 9.0 acres of private land) for ski trails and 3.1 acres for lifts (1.4 acres of NFS land and 1.7 acres of private land) of forested habitat, but no substantial effects to any common, ecological indicator, or management indicator wildlife species or their habitat.
3.6. TEPS and RFSS	The No Action would cause “no effect” to individual TEPS and/or “no impact” to the population or species of RFSS.	The BE determined, the Proposed Action is “not likely to jeopardize continued existence or adversely modify proposed critical habitat” for federally proposed endangered northern long-eared bat. Also, the Proposed Action

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		“may impact individuals, but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species” of eastern small-footed bat, little brown bat, or tri-colored bat. The Proposed Action would cause “no impact” to the population of undiscovered RESS-listed plants.
3.7. Visual	No change	Project consistent with Scenic Integrity Objectives for MA 7.1.

**Table 2.5-1 (cont.)**

3.8. Recreation	No change.	Improvement in winter recreation opportunities.
3.9. Socioeconomic	No change	Anticipated improvement in direct, indirect and cumulative socioeconomic benefits from the resort. Reduced shuttle buses through the Westwood Homeowners Association area.
3.10. Traffic	<p>No Change</p> <ul style="list-style-type: none"> <li>• Loon Mountain administrative traffic, employee traffic, shuttle buses, certain government agency traffic and residential traffic will continue at current levels along Loon Brook Road according to the terms of the current Memorandum of Understanding between Westwood Homeowners Association and owners of the private Loon Brook Road.</li> <li>• Traffic along Route 112, Loon Mountain Road, and Cooper Memorial Drive will remain unchanged.</li> <li>• Existing gate/card access and attendant during high traffic periods will remain in place.</li> </ul>	<ul style="list-style-type: none"> <li>• Increase in non-peak traffic on Cooper Memorial Drive from Route 112 into the South Peak Learning Center; parking area limits additional increases in peak day (weekend and holiday) traffic.</li> <li>• Decrease in shuttle traffic on Loon Brook Road between Cooper Memorial Drive and Loon Mountain Road through the Westwood Homeowners Association due to increased ski access between areas and reduced demand for shuttle traffic.</li> <li>• Decrease in traffic along Route 112 between Cooper Memorial Drive and Loon Mountain Road,</li> <li>• Temporary increase in construction and administrative traffic along Loon Brook Road between the base area and the Learning Center during periods of construction.</li> <li>•</li> </ul>

### 3 Existing Conditions and Environmental Effects

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This chapter discloses the direct, indirect, and cumulative environmental effects to the physical, biological, social, and economic resources from the Proposed Action and the No-Action alternative as described in Chapter 2. It consists of a description of the existing conditions for each affected resource area, and then summarizes the environmental effects of each alternative. These effects are summarized in a comparative format in Table 2.5-1 in Chapter 2. Detailed background information or field data (e.g., results of field surveys) from which the environmental effects are concluded can be found in the project file.

For each resource considered, an analysis area is identified in both space (how broad a geographic area should be analyzed) and time (how far into the past and the future should be analyzed). The analysis area described for the direct and indirect effects for each resource discipline may differ depending on the characteristics of the resource. Since cumulative effects are based on the time and geographical space of the effects of other actions that may overlap with the Proposed Action, the analysis area for cumulative effects may differ from that described for direct and indirect effects for the same resource. Actions on NFS and non-NFS lands are included when considering cumulative effects.

#### *Assessment of Cumulative Effects*

NEPA regulations state that an appropriate analysis of cumulative effects requires that “the incremental effect of the [present] action” be “*added to the past, present, and reasonably foreseeable future actions*” (40 CFR § 1508.7). Per Forest Service regulations (36 CFR 220), a reasonably foreseeable action on NFS lands is one for which the Forest Service has received a proposal which describes the Proposed Action in sufficient detail (when, where, how) to allow for substantive effects analysis. Reasonably foreseeable future actions need to overlap with direct and indirect effects in both space and time. Therefore, both when and where an activity will occur are required in order to know whether the Proposed Action would add measurable cumulative effects when combined with such projects.

### **3.1 Water Resources**

The issues central to water resources mainly focus on water availability for snowmaking. First, would water that is currently being used to open intermediate and more advanced terrain be diverted to the new terrain at the proposed Learning Center, and second, to what extent would the new Learning Center increase water use for snowmaking?

#### *Direct and Indirect Effects Analysis*

The East Branch of the Pemigewasset River shown in Figure 3.1-1 is located within the greater Pemigewasset River Watershed. The direct and indirect analysis area for consideration of potential effects to water resources includes the stream, river, wetland and seasonal pool waterbodies that receive runoff directly from areas modified by the Proposed Action or are in close downstream proximity to the water intakes that support the proposed action. This analysis area is large enough to encompass project activities, but not so large that project effects would be highly diluted by including a much larger water body (such as the Pemigewasset River). Connector Pond is also a source of snowmaking water, but because it is a private, man-made pond, the impacts of water withdrawal to the pond are not regulated by the Forest Service. The analysis area for the direct and indirect effects on water resources is shown in Figure 3.1-2.

#### *Existing Conditions*

##### *Surface Waters*

The East Branch Pemigewasset River (USGS Hydrologic Unit Code HUC8 01070001) is one of the principal water resources associated with the Proposed Action. It is one of seven major tributaries of the Pemigewasset River, originating

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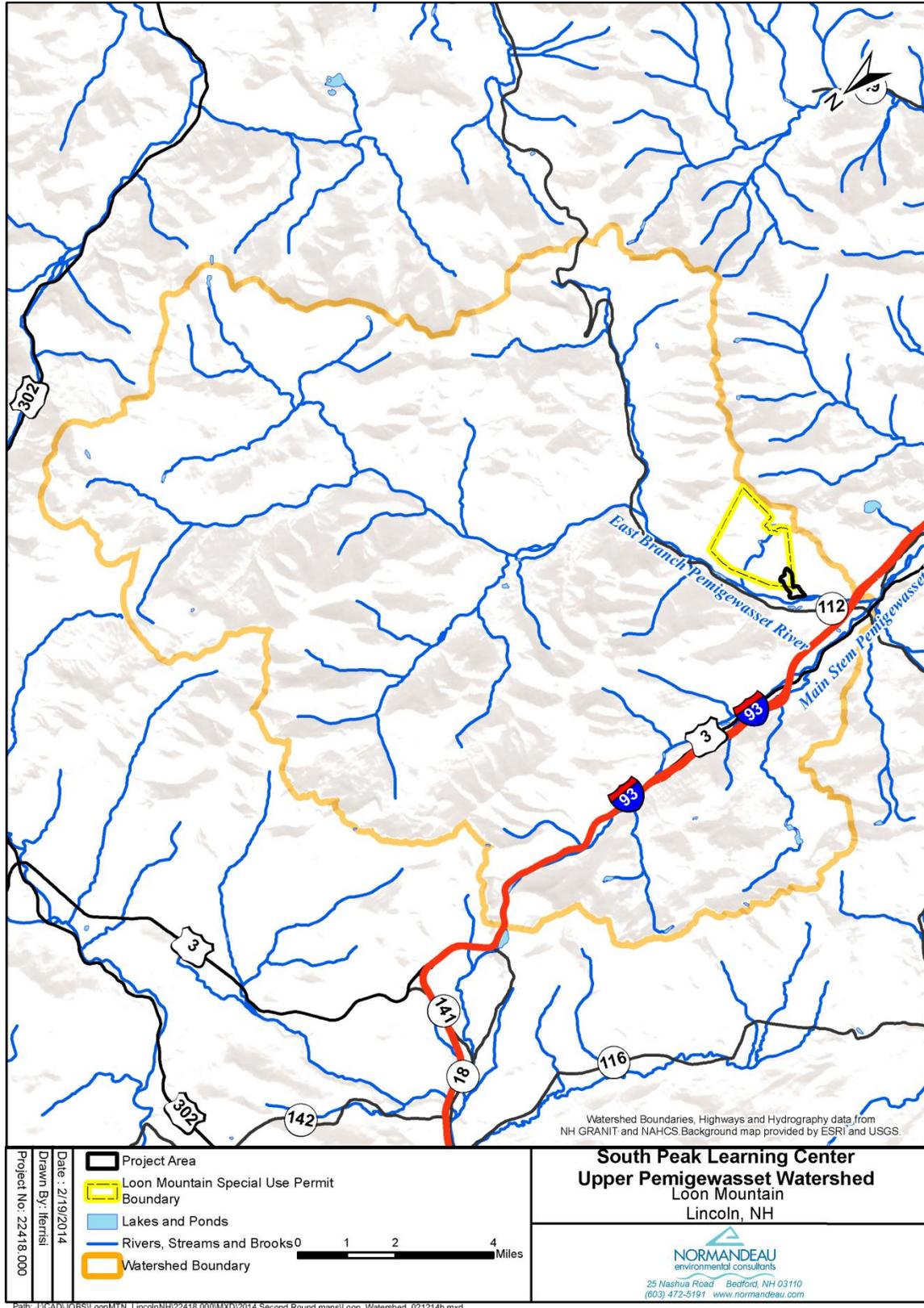


Figure 3.1-1. Watershed Area Map

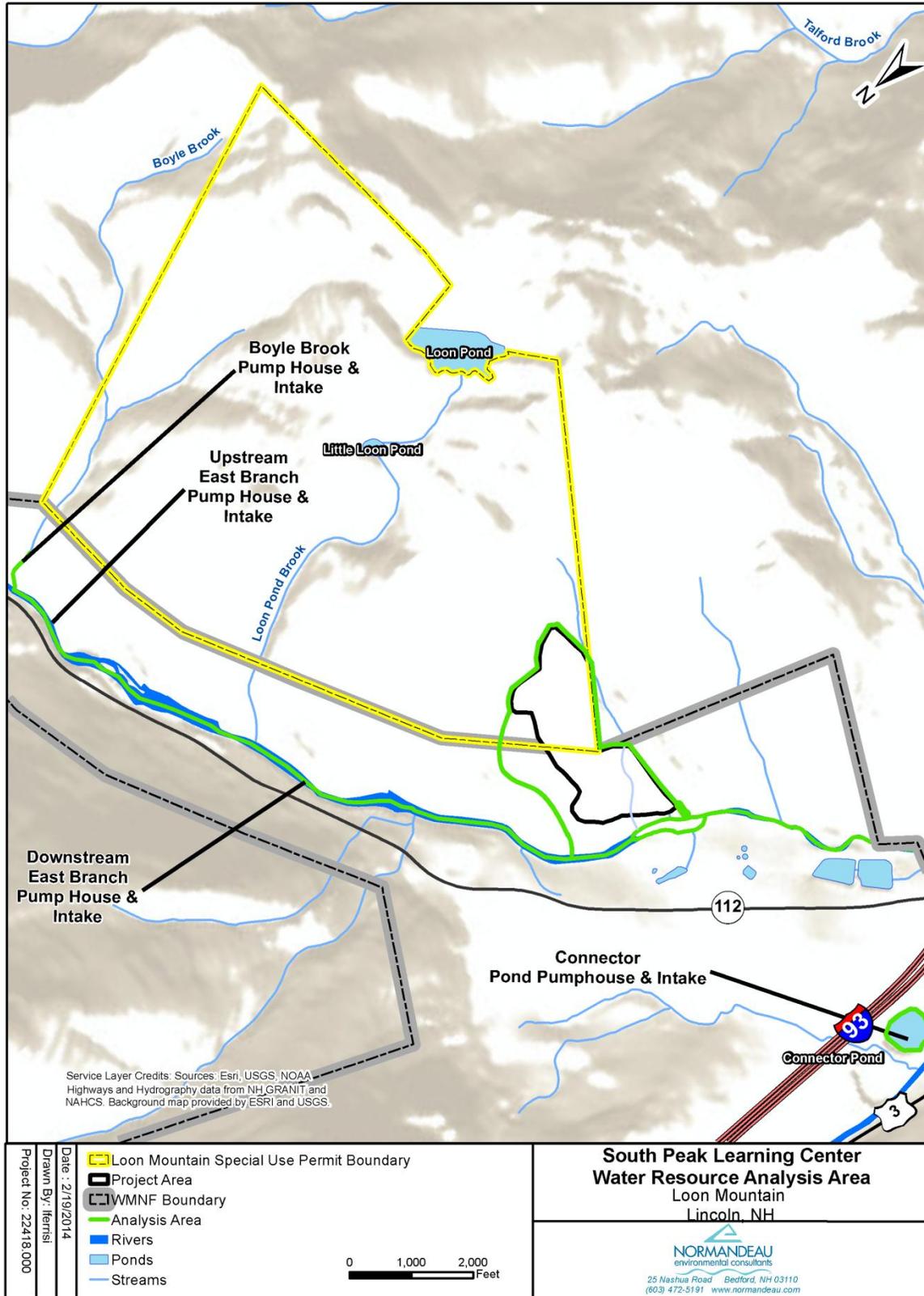


Figure 3.1-2. Analysis Area Water Resources Map

in the Pemigewasset Wilderness Area, the largest wilderness on the White Mountain National Forest.

The East Branch joins the Main Stem of the Pemigewasset River in the town of Woodstock, New Hampshire near Interstate-93 after flowing southwest on the north side of Loon Mountain ski area in Lincoln, New Hampshire. The East Branch watershed area where it meets the Pemigewasset Main Stem is 117 square miles (USDA-Forest Service 2002) and is part of the greater Pemigewasset River watershed which drains approximately 1,000 square miles.

Field studies of the project area revealed several unnamed streams (Normandeau Associates, Inc. 2013a). With one exception, all are ephemeral or intermittent. One was determined to be perennial. All are tributary to the East Branch (Figure 3.1-3).

Important water bodies outside of the project area include Boyle Brook, the East Branch and Connector Pond, all of which serve as sources for snowmaking water.

### *Surface Water Quality*

The overall water quality in the East Branch is considered to be good aside from high nitrate and phosphorus levels immediately downstream of the Town of Lincoln sewage treatment plant discharge location (Virginia 2009). Under New Hampshire Surface Water Quality Regulations, RSA 485-A: 8, the East Branch is designated as Class B water. Class B waters are of the second highest quality and are considered suitable for fishing, swimming and other recreational purposes and, after adequate treatment, the potential for use as water supplies.

Section 305(b) and 303(d) of the Federal Clean Water Act requires states to monitor the quality of surface waters, publish the results periodically, and to list those waters that are impaired with respect to one or more Water Quality Criteria and are in need of a Total Maximum Daily Load (TMDL) determination.

The following waters within or adjacent to the analysis area are listed on the NH 2012 Integrated Listing of Threatened or Impaired Waters That Require a TMDL (which includes both 305(b) and 303(d) waters; NHDES 2013):

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- The East Branch as it runs through Lincoln is impaired for aquatic life due to low pH from unknown sources.

Low pH is typical across the WMNF and may be due to a combination of naturally low buffering capacity in the soil and bedrock of Forest watersheds, naturally occurring organic acids and human-caused acid deposition effects (Hornbeck et al. 2001).

- 17.7 miles of the East Branch has a TMDL for mercury (USEPA 2010).

The US Northeast receives atmospheric inputs of acidic compounds and mercury, largely from downwind, out-of-state sources. Virtually all waters in NH and the New England were previously listed as impaired by mercury, prior to the development of the regional TMDL by EPA.

### *Snowmaking*

Loon Mountain currently withdraws water from the following existing permitted water resources: the East Branch (two locations), Boyle Brook, and Connector Pond (Figure 3.1-2). These authorized water withdrawals, and associated pumping capacities for snowmaking include:

- Upstream intake gallery on the East Branch (approximately 500 ft upstream of the bridge to the main resort), with an authorized and installed pumping capacity of 2,000 gallons per minute (gpm).
- Downstream intake gallery on the East Branch (approximately 1,000 ft downstream of the mouth Loon Pond Brook), with an authorized pumping capacity of 10,000 gpm. In the past, the installed pumping capacity at this intake is 4,800 gpm, but Loon Mountain recently (November 2013) upgraded the pump capacity to 8,000 gpm.
- Intake gallery on Boyle Brook with an authorized and installed pumping capacity of 500 gpm.
- Connector Pond with estimated usable volume of approximately 63 million gallons (Mgal).

East Branch and Boyle Brook water withdrawals are regulated by wetlands permits issued by the New Hampshire Department of Environmental Services (NHDES), and the U.S. Army Corps of Engineers (USACOE). No withdrawal is

allowed if streamflow is less than the 87.8 cubic feet per second (cfs) (USDA-Forest Service 2002). Similarly, no withdrawal from Boyle Brook is allowed if streamflow is less than 1.17 cfs. Both minimum flows reflect guidance from USFWS and NHDES which states that seasonal median flows are ecologically significant and no withdrawals should be allowed when base flow is less than or equal to median flows. During the winter, water withdrawals are regulated by February Median Flow (FMF). Connector Pond is an off-stream, private, excavated pond that therefore has no minimum flow associated with it. Furthermore, the pond has been isolated from the main stem of the Pemigewasset River by sheet piling to prevent indirect withdrawal from the river during times when Loon Mountain is actively withdrawing for snowmaking.

Loon Mountain has an existing water demand of ~400 Mgal per year, based on a total of 324.6 acres of existing snowmaking terrain and using the methods for determined snowmaking demand found in the 2002 Loon Mountain Expansion EIS (USDA-Forest Service 2002; Pioneer Environmental Associates 1999a). Water availability from Loon Mountain's approved snowmaking sources is sufficient to easily meet Loon Mountain's existing performance goals of coverage of 80% of snowmaking terrain in 80% of the years (USDA-Forest Service 2002).

### *Groundwater*

Groundwater at Loon Mountain is limited but of high quality (Virginia 2009). Groundwater resources in this assessment area are described as shallow unconsolidated aquifers and deeper fractured bedrock aquifers. Shallow aquifers yielding significant quantities of groundwater are primarily composed of sands and gravels and are primarily limited to the river valleys of the two branches of the Pemigewasset River (USDA-Forest Service 2002). Variable thickness of saturated material and variations in material properties results in a substantial range in water yield from wells constructed in such aquifers. Individual well yields could be expected to range from 50 to 500 gpm. A United States Geological Survey (USGS) study concluded that approximately 4.0 square miles in the Town of Lincoln, is underlain by stratified drift aquifers. A more detailed assessment by USGS showed the locations of these aquifers to be along the East Branch and Main Stem of the Pemigewasset River Basin (USDA-Forest Service 2002).

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Groundwater in fractured bedrock aquifers is transmitted through fracture networks within the bedrock. Because of the fractured nature of the bedrock aquifer, well yields tend to be highly variable and typical yields are less than 50 gpm. Essentially all of Lincoln is serviced by municipal water systems (USDA-Forest Service 2002).

Neither stratified drift nor fractured bedrock aquifers have sufficient capacity to meet Loon Mountain snowmaking needs (Pioneer Environmental Associates 1999a).

### ***Wetlands***

In September and October, 2011, Normandeau Associates, Inc. conducted a wetland survey of the proposed areas of disturbance (Normandeau Associates, Inc. 2013a). All identified wetlands were delineated using the Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: North-central and Northeast Region (USACE 2011). Normandeau also conducted vernal pool surveys on June 13, 2010. The entire South Peak Learning Center project area was again reviewed for potential vernal pools in May of 2011. A total of 14 wetlands, 30 streams and 0 vernal pools were identified during field surveys (Normandeau Associates, Inc. 2013a) (Figure 3.1-3).

All wetlands were associated with disturbed conditions; primarily the existing ski slopes and work roads, or logging activity. Eleven of the wetlands occurred on existing ski trails (and in one case [Loon Mountain Wetland (LMW) 6] abandoned ski trail) and thus are subject to a high amount of disturbance, including repeated mowing and large amounts of hydrologic input from snowmaking. It is likely that these actions result in compaction and saturation that was not present prior to clearing, resulting in inadequate drainage and thus creating an environment suitable for wetland development. All of these wetlands are classified as Palustrine Emergent Wetlands, colloquially known as wet meadows, dominated by persistent vegetation and with seasonally saturated conditions (PEM1E). The following herbs were typical: fringed sedge (*Carex crinita*), sallow sedge (*Carex lurida*), woolgrass (*Scirpus cyperinus*), soft rush (*Juncus effusus*), rough-leaved goldenrod (*Solidago rigida*), grass-leaved goldenrod (*Euthamia graminifolia*), and New York fern (*Thelypteris novaboracensis*). Shrub

species observed included meadowsweet (*Spiraea alba var. latifolia*), raspberry (*Rubus idaeus*), and willows (*Salix spp.*), along with sapling American beech (*Fagus grandifolia*), yellow birch (*Betula alleghaniensis*) and red maple (*Acer rubrum*).

Most streams (streams are components of wetland resources and subject to wetland permitting) in the project area are ephemeral or intermittent although there is one perennial stream that passes through the eastern corner entirely on private land.

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

All ground-disturbing activities have the potential to have direct and indirect effects on water resources.

#### **Alternative A: No-Action**

Alternative A would not change the current conditions of water resources. There would be no additional ground-disturbing activities and thus no increased risk of soil erosion and sedimentation or runoff. Existing snowmaking withdrawals would continue when streamflow is above 87.8 cfs on the East Branch and 1.17 cfs on Boyle Brook, but the rate of withdrawal on the East Branch would be increased to 8,000 cfs when streamflow is sufficient to do so. Snowmaking on existing terrain would remain the same although increased pumping capacity would allow Loon Mountain to make artificial snow more rapidly when conditions for snowmaking are suitable.

#### **Alternative B: Proposed Action**

Impacts to water resources under Alternative B would include:

- increased water withdrawal over current withdrawal for snowmaking, but within the existing minimum flow requirements;
- a small increase in runoff quantity during snowmelt due to additional snowmaking coverage of the South Peak Learning Center;

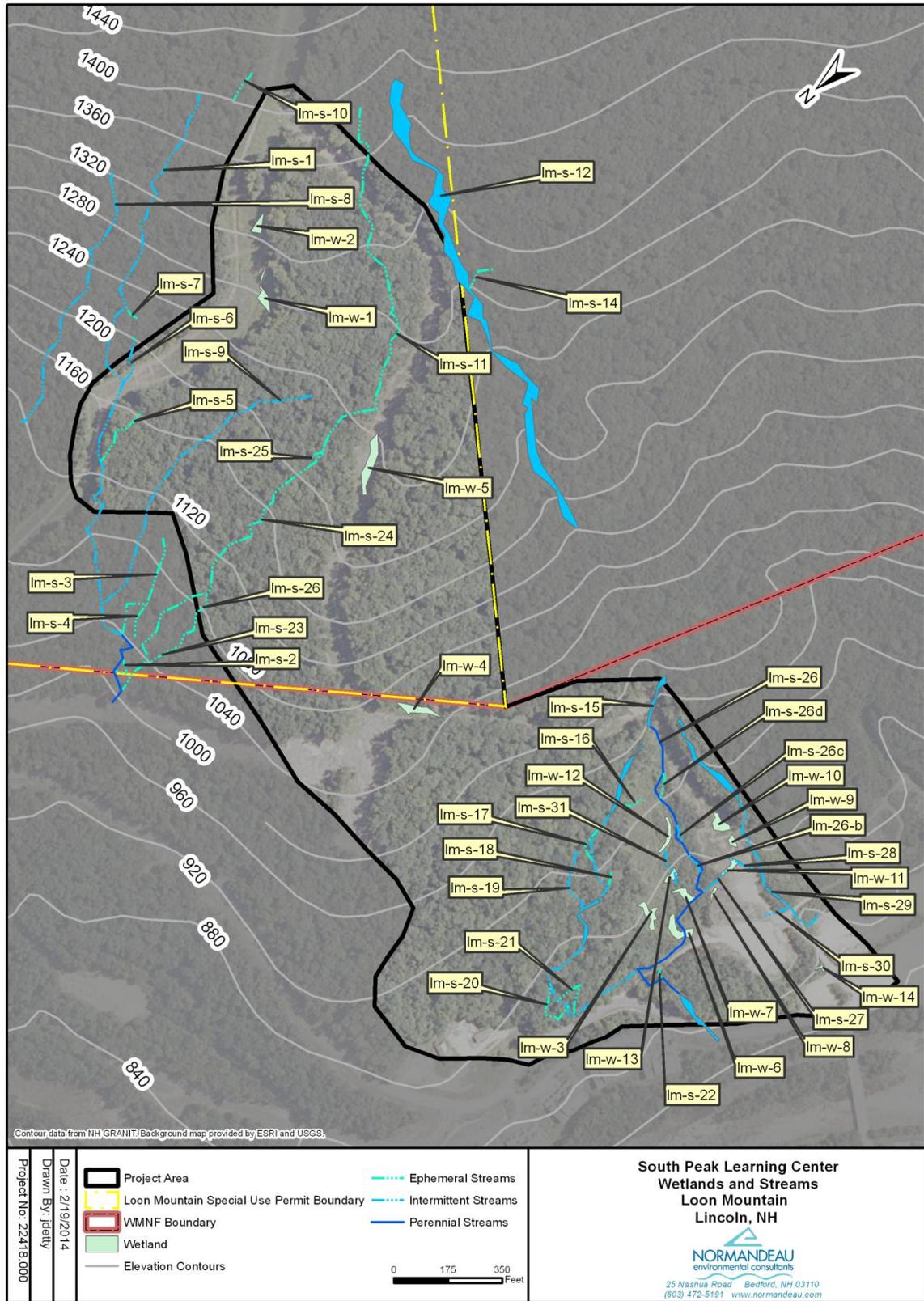


Figure 3.1-3. South Peak Learning Center Wetlands and Surface Waters.

## Loon Mountain Ski Resort South Peak Learning Center Project

- effects to wetlands, crossing of ephemeral, intermittent and perennial streams by new ski trails and lift lines

Each of these potential effects is discussed below.

### *Snowmaking*

Snowmaking for the South Peak Learning Center project is proposed on all new terrain. This would require installation (generally aboveground) of approximately 10,400 feet of snowmaking pipeline; about 5,000 feet would be placed on NFS lands and 5,400 feet would be placed on private lands.

Approximately 3,000 feet of line is already in place on *Escape Route* which would be incorporated into the Learning Center. Existing water supply sources are sufficient to meet the snowmaking demand (coverage, depth and completion dates) of the proposed terrain expansion. Snowmaking would be accomplished using energy efficient snowmaking technology. Snowmaking supply lines are already in place in the project area (*Escape Route*) so no new pump houses would be required. The water sources for snowmaking are not on NFS lands. Their use on Loon Mountain terrain was analyzed and approved in the 2002 Loon Mountain Ski Resort Development and Expansion FEIS Record of Decision (Loon Mountain 2002 FEIS ROD) (USDA-Forest Service 2002).

With the proposed addition of approximately 18.7 acres of new terrain at the South Peak Learning Center, Loon Mountain's snowmaking terrain acreage would increase to about 343.3 acres from the existing 324.6. Using the resort goal of three complete coverages per year on 100% of their terrain, at the snow depths used by Pioneer Environmental Associates (1999a) in its snowmaking demand analysis for Loon Mountain, the existing demand would increase from approximately 400 Mgal to about 415 Mgal, or 3.75%.

Loon Mountain has adopted the widely used "80/80" guidance for snowmaking system capacity, which means that their system should be sized to meet no less than 80% of their water demand in no less than 80% of the years. According to methods presented in Pioneer Environmental Associates (1999a, 1999b), the 80/80 demand for Loon Mountain's existing 324.6 acres of terrain is ~320 Mgal per year. With the proposed Learning Center, snowmaking terrain would increase to 343.3 which would have an associated 80/80 demand of approximately 336 Mgal

per year. Loon Mountain’s existing snowmaking supply sources (Boyle Brook, East Branch Upper and Lower and Connector Pond are capable of supplying an 80/80 demand of approximately 372.5 Mgal (from data provided in Pioneer Environmental Associates 1999b). Thus it can be concluded that the existing snowmaking system can easily accommodate the snowmaking needs of the Proposed Action when combined with the needs of existing terrain and at full permitted build-out. Snowmaking terrain and demand summaries for Alternative A and Alternative B scenarios are shown in Table 3.1-1.

**Table 3.1-1. Snowmaking Demand under Existing and Proposed Conditions**

	Alternative A		Alternative B	
	Existing	80/80	With Existing Demand	80/80
Snowmaking Terrain (acres)	324.6	324.6	343.3	343.3
Water Demand (Mgal) for 100% coverage	~400	~320	~415	~336

With respect to the concern expressed during scoping that early season snowmaking on the proposed Learning Center terrain would occur at the expense of snowmaking on more advanced terrain, Loon’s recent (2013) increase in pumping capacity from the past rate of 7,300 gpm to 10,500 gpm eliminates this concern. This represents a 44% increase in the ability to deliver snowmaking water on-mountain. Since the proposed Learning Center represents a snowmaking terrain increase of only 6.5% over existing terrain and an 80/80 demand increase of only 5%, it is clear that the new pump capacity upgrade would easily accommodate the Learning Center terrain while enhancing snowmaking throughout the resort. It should also be noted that Loon’s permitted withdrawal rate is 12,500 gpm which means there is still an additional 2,000 gpm available for use, should additional pumping capacity be required in the future.

***Increased Runoff***

Peak run-off and streamflow during snowmelt events are controlled primarily by climatic conditions affecting the rate of melting. Unlike natural snow, machine-made snow is denser and therefore tends to melt more slowly, delaying runoff (Shanley and Wemple 2009).

Carlson and Fay (1998) analyzed effects of snowmaking to water resources and concluded that more snow does not usually mean faster melting or increased runoff rates. They found that the maximum water-depth equivalent from snowmelt is approximately 0.5 inches per day, whether it is a natural or artificial snowpack that is melting. As a result, the net effect of an increased snowpack caused by snowmaking on new trails is generally one of a longer snowmelt season and a greater duration of the seasonal higher stream flow period instead of an increase in peak runoff quantities. Initially, this prolonged period of higher flows may cause some minor modifications to downstream channel bank and substrate conditions, but those effects appear to be short-term. Snowmaking did not appear to produce long-term erosion effects on the streams examined (Carlson and Fay 1998).

The presence of snow on new ski trails may also reduce peak runoff discharges from those areas because snow can provide additional water storage. The time difference between rain falling on snow and the release of the rain from the snowpack causes slower runoff and a reduction in peak discharges in areas of channelized flow, relative to snow-free area. In addition, areas that receive machine-made snow often produce snowmelt runoff later in the spring due to a denser snowpack which generally takes longer to melt than the snowpack in areas other than ski trails (Carlson and Fay 1998). This delayed runoff effect would be expected to be further aided by the increased volume of machine-made snow at the South Peak Learning Center from this proposed project. While there would always be periodic floods due to extreme natural climatic events, and those extreme floods could significantly modify downstream channels, additional snowmaking would provide only negligibly increased runoff volumes and would therefore not measurably affect winter or spring flooding events.

Carlson and Fay (1998) also reviewed the effects of snowmelt on water quality and found there to be no significant effects for the areas that were examined. It is therefore concluded that there would be no significant downstream effects associated with snowmelt runoff.

*Erosion and Sedimentation*

The Proposed Action would result in substantial, though temporary, soil disturbance from trail and chairlift line clearing and grading, chairlift installation and construction of the new base lodge. Earthwork would occur on all new trails due to clearing and grading and in small, localized areas directly in the footprint of the chairlift towers and the base lodge. Although approximately 18.7 acres of forest would be cleared and graded for ski trails and 3.1 acres of forest cleared for lifts, soil disturbance would be limited in location and duration. Forest Service Standards and Guidelines for trail construction limit linear earth disturbance to no more than 600 lineal feet or 2 acres on any one trail, without stabilization, so the potential for erosion of unstabilized soils is substantially reduced. Furthermore Forest Service Standards and Guidelines require all soil disturbing activities to implement erosion control measures (for example, silt fences, hay bales, rock check dams, etc.) prior to and during disturbance, further limiting the potential for significant erosion and sedimentation. Experience on the Forest and as documented in monitoring reports (USDA Forest Service 2011a contains monitoring data for Loon Mountain) has shown that these measures are effective in containing erosion and sedimentation. Accordingly, it is expected that sediment entering waterbodies from the Proposed Action would be minor and in compliance with New Hampshire Water Quality Standards as long as the Forest Plan Standards and Guidelines are followed.

As discussed above, the Proposed Action would not generally result in an increased peak rate of runoff; thus the potential for increased erosion or sedimentation is negligible. And because channel forming flows (i.e., flood flows) would not be affected appreciably, the potential for excessive scouring or channel/bed erosion is minimal.

*Wetlands and Surface Waters*

Impacts to 22 of the 30 wetlands were avoided by trail alignment adjustments. Two wetlands would be partially impacted due to clearing only for a ski lift corridor. Both occur within an abandoned ski slope, and are dominated by grasses and sedges, with woody species such as red maple, meadowsweet and

Loon Mountain Ski Resort South Peak Learning Center Project

speckled alder beginning to colonize. Total wetland impacts due to clearing are 2,040 square feet (0.04 acre).

A total of 12 streams would be impacted at one or more segments by trail clearing and ski lift corridor clearing. One stream is perennial, six are intermittent and five are ephemeral. Three of the streams would be crossed by more than one ski trail, and three streams would be crossed by a ski trail and a ski lift. Ephemeral streams, which are regulated under Section 404 of the Clean Water Act, but not by the State of New Hampshire, would be culverted. Intermittent and perennial streams are jurisdictional and those crossings must comply with the New Hampshire Stream Crossing Guidelines (UNH 2009). These guidelines require that the crossings be completed in a manner that assures maintenance of the ability to pass bank-full flows, provide passage of sediment, bedload and woody material and allows for free movement of fish and other aquatic life. The three stream segments under lift corridors would remain open but would have tall, woody vegetation removed across the width of the lift corridor. The existing understory would be preserved and managed to allow limited shrub and sapling regeneration, providing shade to the stream channels within the lift corridor. Shading would minimize thermal impacts to the stream. Total wetland and surface water impacts are summarized in Table 3.1-2.

**Table 3.1-2. Wetland Resource Impacts for the Proposed South Peak Learning Center**

	Impact Type	Impact on WMNF		Impact on Private Lands	
		Linear ft.	Sq. ft.	Linear ft.	Sq. ft.
Wetland	Crossing	-	-	-	-
	Clearing only	-	-	-	2,040
Perennial Stream	Crossing	0	0	110	1,180
	Clearing only	0	0	110	920
Intermittent Stream	Crossing	200	740	645	5,380
	Clearing only	0		65	650
Ephemeral Stream	Crossing	360	1,480	135	950
	Clearing only	0	0	40	160
<b>Total</b>		<b>560</b>	<b>2,220</b>	<b>1,105</b>	<b>11,280</b>

*Cumulative Effects*

The analysis area for cumulative effects to water resources is the same analysis area used for direct and indirect effects to water resources (Figure 3.1.2). The analysis timeframe is 10 years before and 10 years after present. This timeframe was selected because water quality effects from land use changes resulting from ski trail construction and associated vegetation management, erosion control and stabilization would be expected to stabilize totally within a 10-year timeframe.

The past and present land uses affecting water resources are: public land management activities on the WMNF and private residential or business development within the Town of Lincoln. Public land management activities primarily include ski area and cross country ski trail development and maintenance within the analysis area. The Loon Mountain SUP is surrounded by Management Area 6.2 lands within which timber harvesting is not allowed. There are no Forest Service-maintained hiking trails in the analysis area or Forest Service roads, so these types of forest management activities have no impact in the analysis area. On private lands, construction and maintenance of residential and commercial developments has occurred and is expected to continue within the analysis timeframe and analysis area, including construction and maintenance of roads and facilities to provide water supply and wastewater treatment. Adverse effects to water resources from Loon Mountain's activities have likely occurred and are likely occurring, but at low and acceptable levels. Development and expansion within the Town of Lincoln and at the ski resort has potentially resulted in some level of erosion and sedimentation. Alteration of natural flows and minor increased runoff in the spring due to snowmaking occurs annually during the ski season and immediately thereafter. Some of these actions may have affected water quality, but none of the analysis area water resources are listed as impaired by NHDES (except for pH, the source of which is likely atmospheric), which indicates the past and present effects are acceptable from a water quality perspective. Implementation of federal, state and local regulations governing these activities has mitigated potential effects.

Recently developed or proposed projects on the WMNF that provide opportunity for potential cumulative effects from the South Peak Learning

Loon Mountain Ski Resort South Peak Learning Center Project

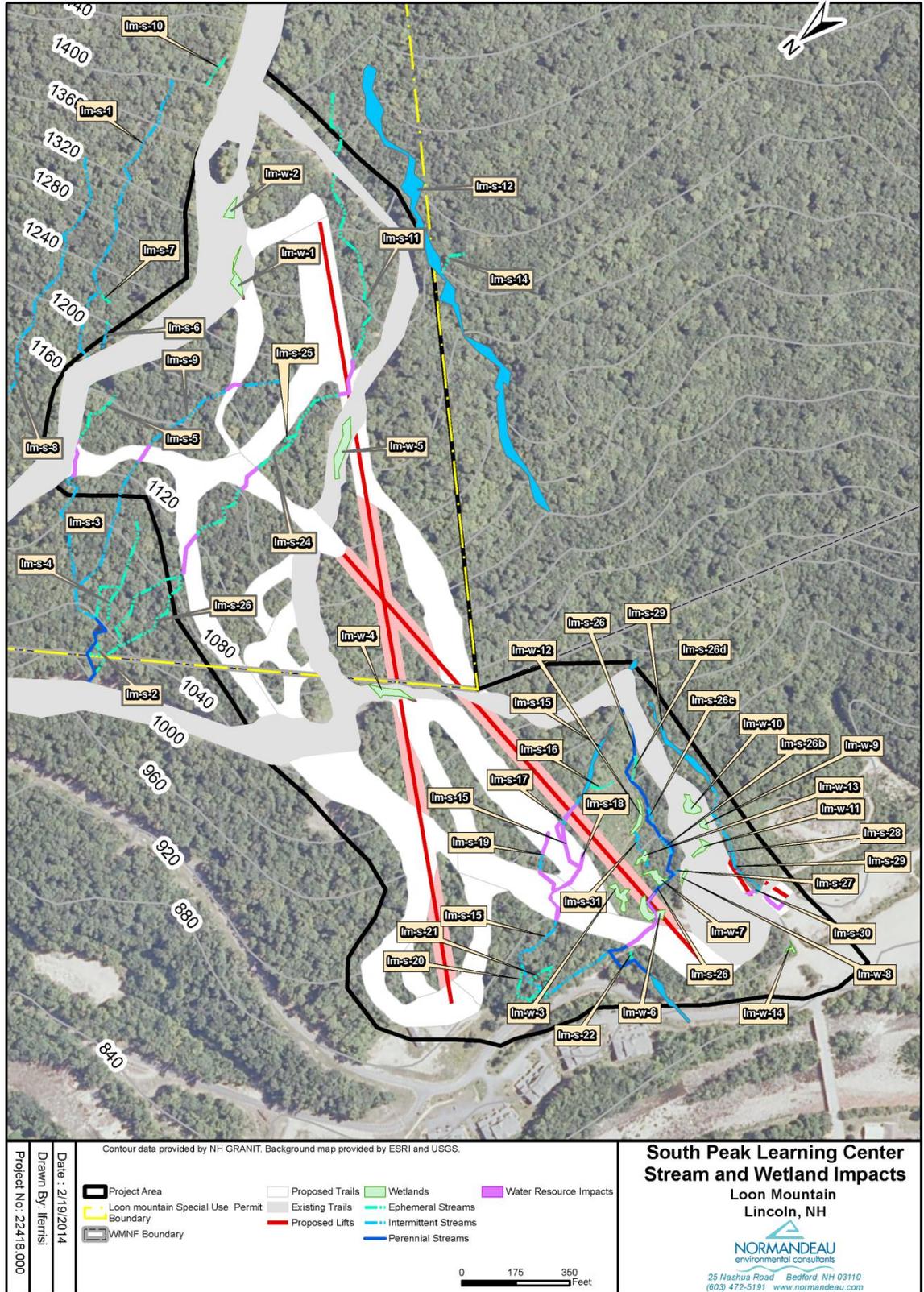


Figure 3.1-4. South Peak Learning Center Effects to Wetlands and Surface Waters.

Center are shown in Table 3.1-3. For each of these projects, resource effects have been avoided, reduced or minimized to the extent that they are not significant.

**Table 3.1-3. Past, Present and Foreseeable Future Projects within or near the Cumulative Effects Analysis Area**

Past	Recent and Future
Implementation of Loon Mountain 2002 EIS ROD – Main Mountain = 43.1 acres of new terrain; South Peak – 73.2 acres of new terrain, including <i>Undercut Glade</i> (9.8 acres) – NFS and private lands	Implementation of Loon Mountain 2002 EIS ROD – Main Mountain = 25.9 acres of permitted terrain – NFS lands
Constructed <i>Escape Route</i> on South Peak – 2005 – NFS and private lands	South Mountain Resort continued development – 345 acres – private lands)
<i>Buck Saw Glade</i> opened 2004 (2 acres on Main Mountain) – NFS lands	Forest Ridge development (private lands) – 800+ acres, 500 acres reserved for green space, north side of river
Loon Mountain Adventure Park rope course Main Mountain 2012 – NFS and private lands	Town of Lincoln repair of water supply intake gallery in the E. Branch – private lands
Lost South Peak XC ski trails due to South Peak alpine terrain and South Mountain Resort development – NFS and private lands	Town of Lincoln re-construction of E. Branch levee near South Mountain Resort private lands – private lands
South Mountain Resort development – approved 2006 – 345 acres – private lands	

The foreseeable future actions/land uses are largely extensions of recent past action and would therefore be expected to have similar insignificant impacts. Private development of the South Mountain Resort and Forest Ridge are expected to continue and perhaps accelerate with a recovering economy. Limited ski area expansion, as approved in the Loon Mountain 2002 FEIS ROD, or other minor trail expansion or improvement, including approved summer recreational uses, may occur within the Special Use Permit boundary area. Projects on the Forest would not be expected to have a substantial effect on water resources within the analysis area because of implementation of Forest Plan Standards and Guidelines and, if necessary, appropriate mitigation strategies. Effects from private development for home sites, roads, other development sites, and recreational activities are more difficult to quantify, but effects to water resources

are likely to continue at low levels, in part because private lands account for a very small percentage of the East Branch watershed in the analysis area and in part because continued implementation of federal, state and local regulations would be expected to mitigate potential effects to acceptable levels. Downstream of the East Branch and Boyle Brook snowmaking intakes, streamflow would continue to be modified during periods of water withdrawal. Because these withdrawals would continue to meet the minimum flow requirements of 87.8 cfs for the East Branch and 1.17 cfs for Boyle Brook, no significant effects to aquatic resources would be expected. Continued development activity within the Town of Lincoln would be expected to increase wastewater treatment and disposal volumes, but not beyond the currently constructed and permitted capacity of the treatment plant; thus no adverse effects to water quality are expected from increased wastewater disposal. It is recognized by the Town of Lincoln, that additional development activities much beyond those currently permitted may necessitate upgrades to the Town's wastewater treatment system, but this action, while anticipated, is not reasonably foreseeable within the analysis timeframe.

Consequently, it is concluded that the Proposed Action would not add any measurable cumulative effect to water resources when combined with recent past, present and reasonably foreseeable future actions within the analysis area

#### ***Snowmaking in a Globally Warming Environment***

The potential future effects of climate change on snowmaking efforts in the Northeast are uncertain. There is strong evidence from a wide variety of observations that the world as a whole is warming at an increasing rate (USDA-Forest Service 2010a). Since 1899, the average annual temperature in the Northeast has increased approximately 2° F (Wake and Markham 2005), with average winter seasonal temperatures increasing by approximately 3° F (Wake and Markham 2005). During the period between 1970 and 2000, average winter seasonal temperatures in the Northeast increased by approximately 4° F (UCS 2006; Rustad, et al 2012). Average annual precipitation in the Northeast has not shown a definitive trend over the past century (USDA-Forest Service 2010b); however, the portion of total annual precipitation that fell as snow in northern New Hampshire and Maine declined between 1949 and 2000 (Huntington et al 2004) and between 1971 and 2000 there was a decline in the number of days with

snow on the ground in Durham, NH of almost 30 days (Wake and Markham 2005). The average growing season in the Northeast has expanded by eight days in the 20<sup>th</sup> century, with most occurring after 1970 (UCS 2006).

Predictive modeling efforts that attempt to estimate the climate in the future continue to improve but are based on inherent sensitivities or biases that produce inconsistent results upon comparison (USDA-Forest Service 2010b). Because data output is given at a global or continental scale, translating that to a regional level creates considerable uncertainty. However, based on a combination of climate predictions from a model called Climate Wizard, and a review of scientific literature by the Forest Service, temperatures are expected to increase in and around the WMNF by several degrees F in the next three decades (USDA-Forest Service 2010b, Rustad, et al 2012).

Even so, the potential effect of climate change on localized snowfall at least here in the Northeast and at the levels discussed above, can be mitigated at more northern and higher elevation ski resorts, including Loon Mountain, by increasing snowmaking (Dawson and Scott 2013). This would require larger and more reliable sources of snowmaking water (generally storage ponds) and greater on-mountain pumping and snowmaking capacity. In much the same way that more southern resorts operate now, more northern snowmaking systems may need to be upgraded to take greater advantage of the smaller but still reasonably dependable snowmaking windows of opportunity. As long as global warming in the Northeast is consistent with current forecasts, most New Hampshire ski areas should be able to adapt and thrive in a globally warming climate (Burakowski and Magnusson 2012).

Given the uncertainty of regional climate change models, the specific needs for increased snowmaking is not presently foreseeable and is therefore not considered in this document. However, given that Loon Mountain recently upgraded their pumping capacity from 7,300 to 10,500 gpm and that they still have an additional 2,000 gpm of permitted capacity available for future use, Loon Mountain would appear to be very well situated to accommodate current global warming forecasts.

### **3.2 Soil Resources**

There is concern that the Proposed Action could cause increased stormwater runoff and associated erosion and reduced soil nutrients.

#### *Direct and Indirect Effects Analysis*

The analysis area for direct and indirect effects to soil resources is that portion of the East Branch watershed as described in Section 3.1 except for those portions downstream of the snowmaking withdrawal intake which would have no impact on soil resources.

#### *Existing Conditions*

A detailed Natural Resource Conservation Service (NRCS) soil survey for that portion of the analysis area that is on NFS lands is not available. Per Forest Service recommendation, Forest Service Ecological Land Type (ELT) information was used to review for shallow soils and ledge. Shallow to bedrock soils have greater erosion potential and sediment control requirements and greater potential tree windthrow due to shallow rooting depth. ELT descriptions include information on general soil associations for each land type (Table 3.2-1 and 3.2-2). Figure 3.2-1 presents the ELTs in the project area. Soil depth criteria is assumed to follow the NRCS mapping protocol in which shallow soils are generally 20 inches or less to bedrock, moderately deep are between 20 and 60 inches, and deep soils are those 60 inches or greater in depth. Field studies were conducted by Normandeau Associates on October 10-11, 2011 to verify existing soil mapping and to identify shallow to bedrock soils within the analysis area. An assessment was made of the general extent (percent of cover) of bedrock within an ELT based on visual observations and observations of the substratum using a handheld screw auger. The extent of shallow soils was based on bedrock outcrops and depth to refusal using a handheld screw auger. Soil borings were conducted randomly to assess the soil texture within the top 12 to 20 inches of the soil profile. The location of observations was logged by GPS along with general notes on surficial features.

**Table 3.2-1. Ecological Land Types<sup>1</sup> mapped within the South Peak Learning Center Project Area.**

ELT Code	ELT Label	Parent Material	Elevation (ft)	Landform	Depth
105	105	Ablation till	1000-2500	Uniform	deep
115g	117	Compacted Sediments	1000-2500	Concave	deep
111	111	Outwash	500-1000	Gently undulating	deep

<sup>1</sup>Source: USFWS White Mountain National Forest GIS data layer. The database incorrectly labeled this unit as ELT 11 which was corrected on Figure 3.2-1.

**Table 3.2-2. ELT<sup>1</sup> Soil Substrata**

ELT Code	Soil Substrata <sup>1</sup>
ELT 105	Soils are moderately rapidly permeable, friable, well drained, cobbly or bouldary, well graded, non-plastic till. Depth 6 to 8 feet to denser less permeable till or ledge. Contain 20 to 40% by volume of sub-round to sub-angular rock fragments.
ELT 115g	Soil materials beneath the surface (2-4 ft) are poorly graded, weakly stratified, dense, compact, imperfectly drained sandy loam to silt loams, containing 5 to 30% cobbles and gravels.
ELT 111	Very rapidly permeable, very deep cobbly loamy sands or sandy, moderately well to excessively drained outwash is typical, but locally ranges to sandy gravels or sandy cobbles. The sands contain little or no silts and the cobbles are subrounded, or mixed rock types and account for 10-90% of the volume.

<sup>1</sup>Source: US Forest Service, Ecological Land Classification, Map Unit Descriptions, White Mountain National Forest.

The portion of the analysis area located on private land has been mapped by the USDA Natural Resources Conservation Service (NRCS) and is available in the Grafton County Soil Survey (Homer 1999). The area consists of two soil types - Becket-Monadnock Association and Adams loamy sand (Figure 3.2-1). The Becket-Monadnock Association is moderately steep (15 to 35%) with deep, very stony, fine sandy loam. The Adams loamy sand map unit is deep with a slope of 3 to 8%.

***Descriptions of the ELTs:***

ELT 105, Hardwood Mid and Lower Mountain Side Slopes with Very Deep Tills. The ELT 105 map unit composes the southern portion of the analysis area on NFS land (Figure 3.2-1), extending from an elevation of approximately 1000 feet to 1440 feet. Observations within this map unit found that the ELT 105 designation

is accurate for this area, with the exception that surface boulders are extensive. Soil textures ranged from fine sandy loam to very fine sandy loam with varying degrees of gravel and subsurface stones.

ELT 115G, Hardwood Undulating and Basin-Like Intervals with Thick Compacted Sediments. The ELT 115G map unit extends from elevation 880 feet to 1240 feet on the northern portion of the analysis area. This unit overlaps NRCS mapping of the Becket-Monadnock Association, moderately steep, very stony map unit. Ledge or shallow to bedrock conditions that could indicate potential ledge was observed scattered within this ELT.

A soil depth criterion is assumed to follow the NRCS mapping protocol in which shallow soils are generally 20 inches or less to bedrock. Bedrock includes exposed rock outcrops to a depth of approximately 6 inches from the soil surface.

An extensive ledge outcrop occurs within the western corner of the ELT, between elevations 920 and 1000 feet. Soil textures range from fine sandy loam to very fine sandy loam. As represented in Figure 3.2-1, the approximate location of the ledge outcrop was delineated within the box. It is within this area that the outcrop was observed and based upon field observations it was not apparent beyond this area.

ELT 111, Softwood Floors and Lower Slopes of Major Valleys and Deep Cobbly and Sandy Outwash. A small area of ELT 111 is included along the northwestern boundary of the analysis area. This area overlaps the 880 foot contour and includes two NRCS web survey mapping units, Adams Loamy Sand, 3 to 8% slope, and Monadnock-Herman Association, hilly, very stony. ELT 111 soils can range from very cobbly loamy sands to sandy gravels. These soils are moderately to excessively drained on outwash.

### ***Revised ELT Boundaries***

ELT mapping within the analysis area is accurate with the exception of an area of ledge outcrops in ELT 115G. This area resembles the soil map unit Rock Outcrop-Lyman Complex (726D). The NRCS describes this map unit as somewhat excessively drained Lyman soils, which are less than 20 inches deep, with rock outcrops. Inclusions of moderately deep Tunbridge soils can be found within this

unit. Figure 3.2-1 delineates the approximate limits of the rock outcrop, which represents a unique feature within this map unit.

***Erosion Potential***

The soil textures within the analysis area are primarily fine sandy loam to very fine sandy loam. The erosion potential for shallow to bedrock soils with either fine sandy loam soils to very fine sandy loam is considered moderate by the NRCS. The erosion potential on deep soils, with moderately steep slopes is also considered moderate. Consequently, the anticipated erosion potential within the analysis area would be considered moderate. A rating of moderate indicates that erosion control measures are needed during certain silvicultural and land-disturbing activities. Slope is a factor, but physical characteristics of the soil are more important.

***Direct and Indirect Effects***

The degree and extent to which an action affects soil is a function of the extent of disturbance, the severity of disturbance, and the ability of the soil to resist change due to certain soil characteristics.

**Alternative A – No action**

Alternative A would not result in additional soil disturbing activities. Therefore erosion and stormwater runoff would not change from current levels. Inherent soil processes and functions would continue.

**Alternative B – Proposed Action**

Construction of the chairlifts and clearing, stumping and grading of ski trails would create substantial soil disturbance. As discussed above, all of the area that would be cleared for new ski trails has a moderate erosion potential. Loon Mountain has extensive and proven experience with ski trail soil stabilizing/revegetation methods from their Forest Service-approved operations and maintenance of their existing ski terrain (see USDA-Forest Service 2011a). Any potential effects would be minimized by the use of erosion prevention and sediment control (EPSC) measures such as barrier fences/construction fences, silt

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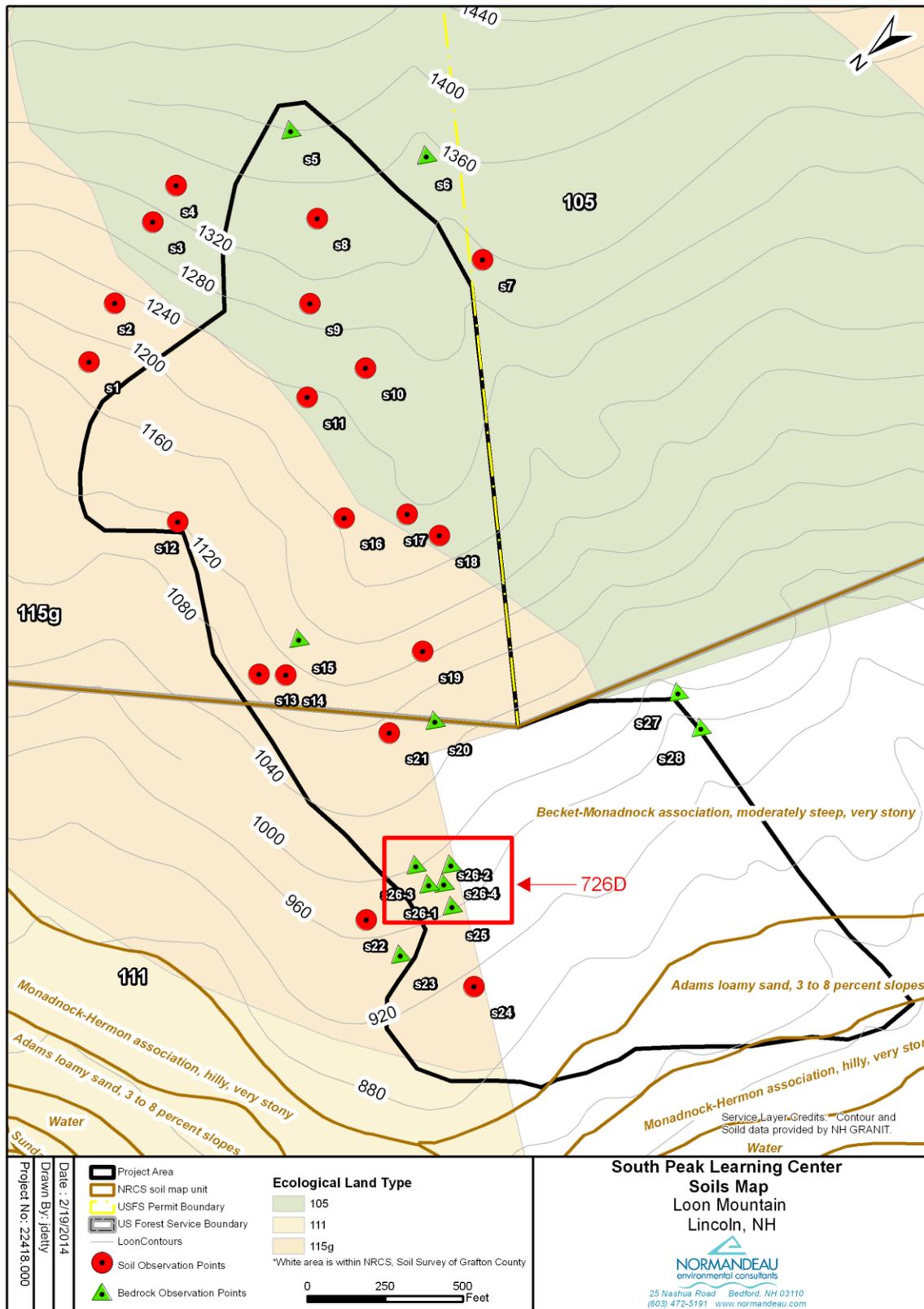


Figure 3.2-1. ELTs and NRCS soil types within the South Peak Learning Center Project Area.

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fences, water bars, sediment traps, swales and check dams, stabilized outfalls and temporary and permanent soil stabilization efforts. All EPSC measures would be implemented in accordance with Forest Plan Standards and Guidelines and New Hampshire Best Management Practices (BMPs). Standards and Guidelines for MA 7.1 limit the amount of contiguous exposed mineral soil to no more than 600 total slope feet (and no greater than two acres) on any ski trail; this limits the amount of exposed soil at any one time which further protects soil resources. Nutrient loss from whole tree removal would be mitigated by chipping small trees and leaving tops and limbs of trees onsite. There would be the potential for windthrow of trees adjacent to the cleared trail areas because of increased wind exposure and especially where soils are shallow and on tree islands where increased wind exposure may be greatest. Loon Mountain has many trails and tree islands, many of which are associated with shallow soils. Experience here has shown that while some weaker trees adjacent to the new slopes could be lost, most are not susceptible to windthrow. In those areas where trees are lost, new trees growing from the existing sapling understory would adapt to the greater wind exposure found on the edge of trails and would therefore be less subject to windthrow. It should also be noted that final trail alignment would be determined in the field during construction. Areas of ledge outcrop where windthrow has the greatest potential would be avoided. Therefore, the level of disturbance from the proposed action would result in no significant negative impact to soil resources in the analysis area.

### *Cumulative Effects*

The analysis area for cumulative effects to soil resources is the same as that identified for direct and indirect effects. The analysis timeframe for assessment of the cumulative effects of past, present, and future soil disturbing activities includes 50 years in the past, when acid deposition began to affect soil productivity, and extends 10 years into the future.

Federal, state and local regulations are designed to minimize project-related effects on natural resources. Soil disturbing activities result in some level of impact to the soil resource. These impacts can vary in both spatial and temporal

scale. Such regulations have been and would continue to be effective in mitigating negative effects to soil resources.

Within the analysis timeframe and area, there have been many past activities that have affected soils. The resource issue to be addressed in this cumulative effects analysis is the need to maintain or improve long-term soil productivity. In order to maintain soil productivity, organic matter and fertility must be retained, and soil displacement (mixing and physically moving soil from one place to another), compaction, erosion and the introduction of contaminants must be prevented. Past and present land uses/actions which have reduced soil productivity are development on private lands, ski area development within the WMNF and various types of use on both private and public lands. The effects of these land uses/actions on soil productivity have not been quantified; however, reasonable assumptions about the effects can be made. Development includes construction and maintenance of roads, homes, businesses and associated water supply and wastewater disposal systems, all of which result in some localized losses in long-term soil productivity.

Development of ski terrain requires tree cutting, stumping, grading, limited snowmaking line burial, work roads, parking lots, access roads and ski lodges and accessory building construction, all of which may result in localized loss of soil productivity. Past timber harvests in the analysis area may have also temporarily affected soils.

The foreseeable future action/land uses in the analysis area are expected to have effects similar to recent past and present activities, mainly soil displacement and compaction and reduced soil productivity (See Table 3.1-3). These projects have the potential to affect soil resources within the analysis area during both construction and operation of the projects; effects could include some level of erosion, displacement, compaction and loss of soil productivity. Following Forest Plan Standards and Guidelines, BMPs, and State and Local regulations will mitigate the associated effects to soil resources.

The cumulative effect of past, present and future actions/land uses on long-term soil productivity is difficult to quantify but can be estimated to range between locally minor to major, depending on the type of effect. However, within the

analysis area as a whole, these actions have not significantly reduced soil productivity, as evidenced by the well-vegetated landscape. Similarly, it is anticipated that the Proposed Action would contribute minimal and insignificant cumulative effects to soils productivity in the analysis area.

### **3.3 Fisheries and Aquatic Resources**

There is the potential for the proposed action to affect fisheries and other aquatic resources. Fisheries and aquatic resources are potentially affected by changes in streamflow caused by withdrawal for snowmaking, aquatic habitat degradation from stream channel alteration of ephemeral, intermittent and the one perennial stream.

#### ***Direct and Indirect Effects Analysis***

The analysis area for direct and indirect effects to fisheries is that portion of the East Branch Pemigewasset River watershed as described in Water Resources (Section 3.1)

#### ***Existing Conditions***

The East Branch Pemigewasset River is the principal water resource which provides habitat for fish and other aquatic organisms that could be affected directly and indirectly by the proposed action. In addition to the East Branch, surrounding aquatic habitat for this analysis also includes Boyle Brook, Sutton Stream and various unnamed intermittent streams described previously.

The East Branch supports all stages of life for resident eastern brook trout (*Salvelinus fontinalis*). In addition to brook trout, past surveys in the East Branch have found rainbow trout (*Oncorhynchus mykiss*), fallfish (*Semotilus corporalis*), longnosed dace (*Rhinichthys cataractae*), slimy sculpin (*Cotus cognatus*), longnose sucker (*Catostomus catostomus*) (USDA-Forest Service 2002).

Historically, New England Rivers supported large amounts of anadromous fish species such as Atlantic salmon and the Pemigewasset Main Stem provided the principle spawning areas for the salmon in the Merrimack River. The East Branch was previously an important Atlantic salmon rearing river for the Merrimack River Atlantic salmon restoration program as Atlantic salmon fry were stocked

each spring in the Merrimack River watershed with restoration beginning in 1976. This effort was part of the Merrimack River Anadromous Fish Restoration Program, a coordinated effort between New Hampshire Fish & Game (NHFG), the Massachusetts Division of Fisheries and Wildlife, the Massachusetts Division of Marine Fisheries, USFWS, the National Marine Fisheries Service (NMFS) and the Forest Service. This program ended in September of 2013 from budget cuts and the effects of Tropical Storm Irene, but primarily due to the low annual returns of sea-run Atlantic salmon (NHFG 2013).

NHFG does however continue to stock the East Branch and the Main Stem annually with Eastern brook trout as a managed game species. Table 3.3-1 provides the age, species of fish, and quantity stocked in the East Branch in 2012. Upstream headwater tributaries of the East Branch likely support self-sustaining populations of eastern brook trout (USDA-Forest Service 2002). However, it is not expected that intermittent streams, particularly within the project area, would contain fish.

*Direct and Indirect Effects*

The Forest Plan Goals for Riparian and Aquatic Habitats (Forest Plan pp. 1-15) include the following: Protect, restore, or improve riparian area conditions to benefit riparian

**Table 3.3-1. East Branch Pemigewasset Fish Stocking 2012**

Town	Species	Age	Number
Lincoln	Eastern Brook Trout	1+YR	1,060
Lincoln	Eastern Brook Trout	2+YR	100

Source: NHFG 2012 stocking report: <http://www.wildlife.state.nh.us/Fishing/Stocking/2012/full.html>

dependent resources and values; and manage riparian areas to provide for coldwater, coolwater and warmwater aquatic communities within the ecological capability of the landscape. This framework is useful for estimating the potential effects of the proposed action and alternatives on fisheries habitat and resources.

As discussed fully in Section 3.2, the proposed action would result in temporary soil disturbance. Any potential water quality effects due to erosion would be minimized by implementation of appropriate erosion control measures. Soil

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sediments entering waterbodies and floodplain areas from the proposed action would be minor as long as the Forest Plan Standards and Guidelines, FSM 2526.03, and associated design criteria are followed.

Water for snowmaking would be withdrawn, when available and while maintaining required minimum flows, from the existing snowmaking withdrawal pump stations on Boyle Brook and the East Branch of the Pemigewasset River.

A total of 12 streams would be effected at one or more segments by ski trail clearing and ski lift corridor clearing. One stream is perennial, six are intermittent and five are ephemeral. All crossing of intermittent and perennial streams would have to comply with the New Hampshire Stream Crossing Guidelines (see Section 3.1). The three stream segments under lift corridors would remain open but would have overstory vegetation removed across the width of the lift corridor. The existing understory would be preserved and managed to allow limited shrub and sapling regeneration, providing shade to the stream channels within the lift corridor. Shading would minimize thermal impacts to the stream.

### Alternative A – No action

Alternative A would not result in effects to fisheries and aquatic resources. Soils would not be subject to disturbance, beyond those actions that are currently permitted by the Loon Mountain 2002 EIS ROD, thus erosion and stormwater runoff would not change from currently permitted levels. There would be no effects to ephemeral, intermittent or perennial streams within the project area as there are no currently permitted actions that would take place here. Consequently, no effects to fisheries and aquatic resources would be expected under this alternative.

### Alternative B – Proposed Action

Construction related effects due to chairlift installation and trail construction would be negligible with implementation of appropriate erosion control measures. No substantial sedimentation to the East Branch or unnamed tributaries in the project area would occur from soil disturbing activities. Soil

sediments entering waterbodies from the proposed action would be minimized and in compliance with Best Management Practices (BMPs) and the Forest Plan Standards and Guidelines, FSM 2526.03, and associated design criteria.

Therefore, only minor effects to fisheries and aquatic resources from soil erosion causing stream sedimentation are anticipated.

Water for snowmaking would be withdrawn, when available, from the existing snowmaking withdrawal pump stations on Boyle Brook and the East Branch of the Pemigewasset River. However, as with current operations, no water would be withdrawn when stream flow was at or below 1.17 or 87.8 cfs, which are the existing permitted minimum flow values for Boyle Brook and the East Branch, respectively. No changes to the pumphouses or intake structures are proposed. Therefore, no adverse effect on fish or aquatic resources is expected.

The proposed action would result in effects (bridging, culverting, vegetation removal) to 535 linear feet (2,590 square feet) of ephemeral stream, 910 linear feet (6,770 square feet) of intermittent stream and 220 linear feet (2,100 square feet) of perennial stream. Potential effects have been minimized to the extent feasible by modifying trail locations and widths. All streams crossed by ski trails would have to comply with the New Hampshire Stream Crossing Guidelines. These guidelines ensure that the physical and ecological functions of intermittent and perennial streams would be maintained (see Section 3.1). Therefore, Alternative B is anticipated to cause minor direct and indirect effects to aquatic resources (including increased water temperature regime, stream sedimentation, and overall stream aquatic ecology) due to riparian overstory clearing and stream crossings.

### *Cumulative Effects*

The analysis area for cumulative effects to fisheries and aquatic resources is the same as that identified for Water resources in Section 3.1. The timeframe for cumulative effects of past, present, and future activities on fisheries and aquatic resources includes 50 years in the past and extends 10 years into the future. This temporal timeframe was selected to reflect the past period when it is reasonable to assume that the fishery resources in the area were largely recovered from early 20<sup>th</sup> century logging practices and a future period reflective of the typical

expected lifespan of an eastern brook trout. The resource concerns of primary importance include maintenance of fish habitat by maintaining minimum flows during snowmaking withdrawals, continuing to control erosion and maintaining water quality parameters that directly or indirectly affect fisheries and aquatic resources.

Although much of the East Branch watershed was heavily logged during the early 1900s, establishment of the WMNF allowed for reforestation of the vast majority of the watershed, resulting in largely reforested watersheds and functioning aquatic ecosystems. Nevertheless, past and present land use activities in the form of residential and commercial development in the Town of Lincoln and recreational activities including ski area development at Loon Mountain Ski Resort on the WMNF all have likely contributed to minor effects on fisheries and aquatic resources from resulting temporary erosion and sedimentation and streamflow modification from domestic water supply and snowmaking withdrawals. However, implementation of federal, state and local regulations regarding erosion control have effectively limited potential effects from erosion to acceptable levels. Similarly, minimum flow requirements for snowmaking withdrawals from Boyle Brook and the East Branch have eliminated potential significant effects of streamflow modification on fisheries and aquatic resources.

### **3.4 Vegetation Resources and Non-Native Invasive Species**

The proposed action would impact vegetation resources on both NFS and private lands. Specifically, tree and vegetation removal due to ski trail and lift line development will be examined herein. In addition, implementation of the proposed action could potentially allow the introduction or expansion of non-native invasive species (NNIS). NNIS are of concern because infestations can reduce the biodiversity of the surrounding area, compete with rare plants, and contribute to a decline in the quality of wildlife habitat by out-competing more desirable native species.

### *Direct and Indirect Effects Analysis*

The analysis area for direct and indirect effects to vegetation resources includes the 77.5 acre South Peak Learning Center project area as described in Section 1.3. and shown on fig 1.3-2.

### *Existing Conditions*

On September 23, 2011, Normandeau personnel surveyed the proposed Loon Mountain South Peak Learning Center project area in order to describe the natural communities on-site (Normandeau Associates, Inc. 2013b). Natural community types observed within the project area during the survey were classified in accordance with *Natural Communities of New Hampshire* (Sperduto and Nichols 2011). The project area is dominated by typical northern hardwoods (*sugar maple-beech-yellow birch*, and *semi-rich mesic sugar maple forest*). Figure 3.4-1 presents the vegetative communities and the locations of the field observation points. Hemlock was generally infrequent and in relatively low abundance in *sugar maple – beech – yellow birch forest*, but its abundance increased along the rocky stream border along the south edge of the project area (OP 7) and in patches elsewhere (for example, OP 6). No rare species or outstanding natural communities as defined by the WMNF Forest Plan were observed during survey efforts, nor are any previously mapped occurrences known.

Existing ski trails were dominated by a combination of common disturbance-tolerant native species and non-native pasture and roadside plants. Five non-native invasive species were observed (see next section below).

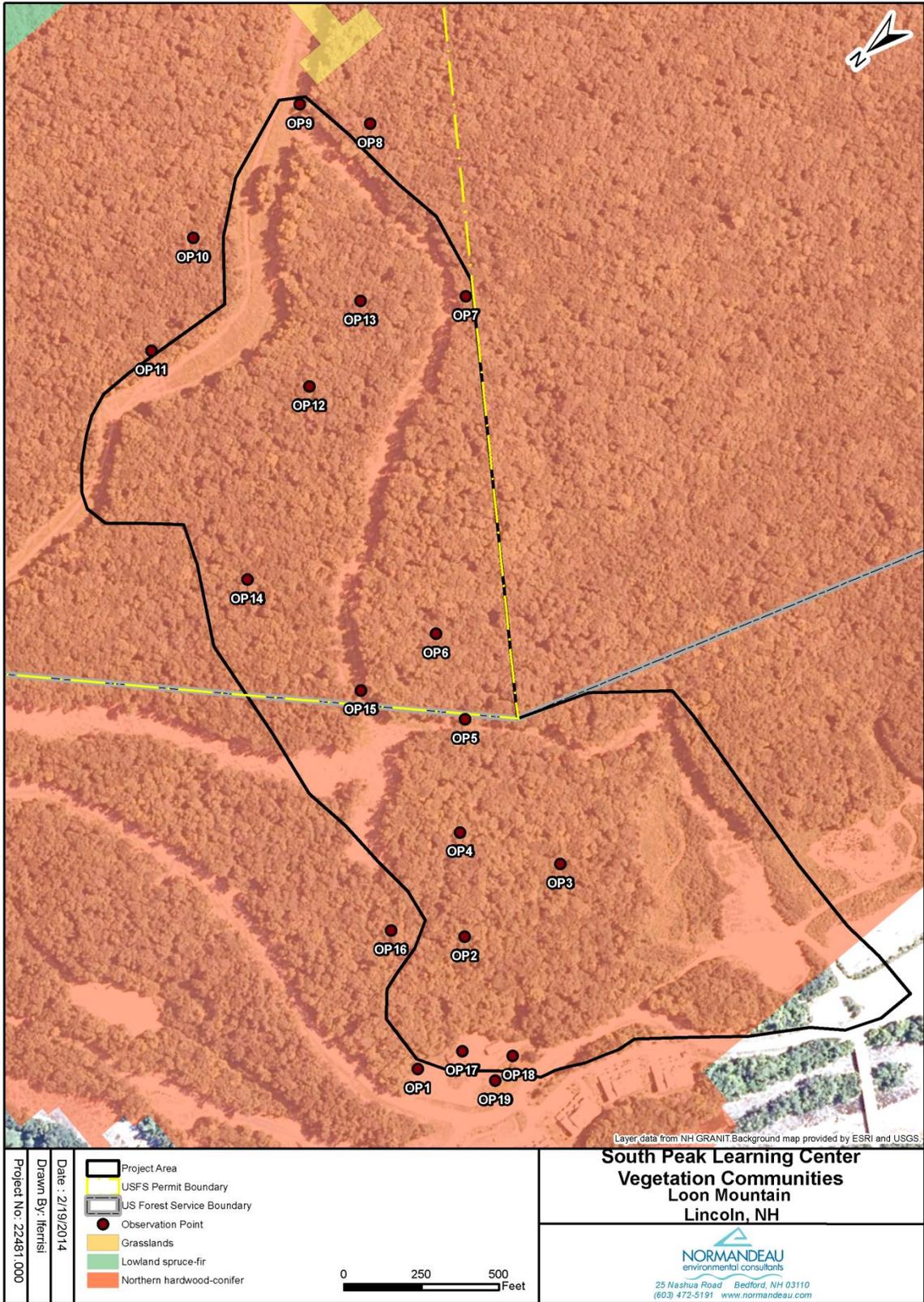
### *NNIS*

The WMNF maintains a non-native invasive plant species list. Five species on this list were observed during the survey. Although our observations do not represent a comprehensive survey and mapping of invasive species locations, they are an indication of the general frequency and abundance of these species in existing maintained openings. Reed canary grass (*Phalaris arundinacea*), coltsfoot (*Tussilago farfara*), and purple loosestrife (*Lythrum salicaria*) were observed on several ski slopes and are probably broadly distributed on ski slopes and other road and parking lot margins, although none were dominant plants in the

localities observed. Black locust (*Robinia pseudoacacia*) and autumn olive (*Elaeagnus umbellata*) were observed adjacent to Crooked Mountain Road; these species are common in developed areas, and adjacent to farmland in the region of the upper Pemigewasset River valley, but less so in interior locations of the WMNF. These plants are likely to remain restricted to maintained openings (roadsides, ski trails); none were observed in any of the forested areas and all have relatively low potential to invade adjacent shaded habitats. Specific observations concerning invasive species are summarized below.

- **1. Reed canary grass** was observed on wet slopes and in ditches on the existing ski slopes (OP 5, 15, and between 11 & 12) within the project area, as well as along margins of the parking lot at the base of the proposed Quad lift (OP 1 and 17).
- **2. Coltsfoot** occurred on existing ski slopes at OPs 5 and 15. Five small patches of plants were observed along a ~50 m length of ski trail at OP 5. More likely exist in disturbed, wet ski trail areas.
- **3. Purple loosestrife** was observed on ski trails (OP 15). Seed capsules were removed from the site.
- **4. Black locust** was observed in the parking lot (one small sampling, OP 17) and also on the cut-bank that descends to the adjacent road at the base of the proposed Quad Lift (OP 18). The latter location consisted of two mature black locust tree clumps and accompanying proliferation of regenerating saplings.

Loon Mountain Ski Resort South Peak Learning Center Project



**Figure 3.4-1. South Peak Learning Center Vegetation Communities**

- 5. **Autumn olive** was observed on the cut-bank (OP 19) between the main road and the parking lot at the base of the proposed Quad Lift. There was one robust shrub here.

*Direct and Indirect Effects*

*Alternative A- No Action*

Alternative A would not affect existing vegetation; ongoing operational and maintenance changes in ski area operations would occur as they currently do. The vegetation types that are present in the analysis area would not be substantially altered. However, there is a low risk that existing NNIS could spread under ongoing operations. See the NNIS section for more information.

*Alternative B – Proposed Action*

Alternative B would directly affect approximately 21.8 acres of currently forested terrain which would be cleared to provide new trails and lift lines. These effects are in keeping with the Purpose and Need for the project and have been anticipated in association with the designation of this Management Area as 7.1 of use in alpine skiing. Effects have been reduced, avoided and minimized as much as possible while still meeting the goals of reduced crowding on learning terrain and improved guest experience. The conversion of 21.8 acres of common forest types to ski trail and associated ski trail vegetation would have minor effects on vegetation integrity or biodiversity of the greater South Peak area.

In addition, a very minor amount of vegetation would be temporarily removed for snowmaking pipeline installation (including the water, air and electrical lines) that would take place along the edge of the proposed ski trails. This effect to vegetation would be negligible to structure and function of the meadow habitats in the analysis area as these areas would be expected to return (except immediately under the pipe) to the existing cover type once construction is complete.

## *NNIS*

Continued recreation use and management of roads, trails, and other infrastructure within the Ski Resort SUP would continue at historic levels. These activities may spread NNIS into currently unoccupied habitat. The current areas with infestations of invasive plants would receive treatments to control these species under the authority of the 2007 White Mountain National Forest Forest-wide Invasive Plant Control Project (USDA-Forest Service 2007). Until such time that each of the existing infestations are treated and completely eradicated, they would continue to persist and potentially spread.

Forest Service Manual (FSM) 2080.44.6 outlines the process to determine the risk of NNIS introduction or spread as part of the NEPA process for proposed actions. Given the implementation of the Forest Plan Standards and Guidelines for controlling the introduction or spread of NNIS, and the known NNIS populations in and around the project area, the overall risk rating assigned for the South Peak Project is “low” (USDA-Forest Service 2005).

Based on the FSM NNIS risk criteria, Alternative B could cause potential minimal effects of introducing and spreading NNIS species. Soil and vegetation disturbance associated with the proposed action, as well as recreation use, have the potential to spread NNIS. Alternative B may increase the spread of NNIS, especially because reed canary grass is known to occur immediately adjacent to the direct disturbance areas. NNIS seeds or other propagules could be inadvertently introduced to newly disturbed ground by construction equipment, wildlife or wind during ski trail and lift construction and installation of the snowmaking lines. This potential is greatest in the vicinity of existing infestations and construction activities. NNIS spread and introduction could occur in other areas due to long-distance seed dispersal via vehicles, wildlife and wind.

All project activities would implement the Forest Plan Standards and Guidelines related to NNIS. This would reduce but not eliminate the possibility of introducing NNIS. The 2007 White Mountain National Forest Forest-wide Invasive Plant Control Project (USDA-Forest Service, 2007) and WMNF Monitoring and Evaluation Guide (USDA-Forest Service, Monitoring and Evaluation Guide, 2006, p. 30-31) requires new monitoring, as well as follow up

monitoring at active control locations. Control and monitoring activities reduce the likelihood of invasive plants spread by project activities becoming established and ensure compliance with Forest Plan direction relating to NNIS (Forest Plan, pp 2-11-12). However, these measures likely would not eliminate all potential for spreading invasive plants within the project area.

Consistent with Forest Plan Standards and Guidelines, Loon Mountain would use weed free materials for hay, mulch, etc. and seed used for re-vegetation would be of native or non-persistent species.

### *Cumulative Effects*

The cumulative effects analysis area for vegetation resources is the Loon Mountain Ski resort (Ski Resort), which includes the project area and private land abutting the Ski Resort (bounded by the East Branch Pemigewasset River to the north and by the WMNF boundaries to the east and west. Concern for cumulative effects to vegetative resources differ from direct or indirect effects in that these concerns examine a larger area where the potential decrease of biodiversity through the reduction of native plant species could occur. The time frame covers a 20-year (10 years past to 10 years in the future) period. The temporal scope was chosen because it represents the time period in which a forested area cleared of trees would typically re-vegetate to a regeneration age forest.

Recently developed or proposed projects in the cumulative effects analysis area that could add cumulative effects with the proposed action are shown in Table 3.1-3. Many of the effects on the vegetation resources are from continued ski trail development per the Loon Mountain 2002 EIS ROD and development on private lands within the cumulative effects analysis area. Under Forest Service management, the effects on vegetation from ski trail development are limited to area already developed for alpine skiing and would not cumulatively add to vegetation impacts.

In the foreseeable future, vegetation is and will continue to be managed to accommodate ski operations within the Special Use Permit boundary. This includes removal of hazardous trees along trail edges, trimming of vegetation

along trail edges, and the removal of understory vegetation in areas designated for tree skiing. In addition, it is expected that the development activities cited above would continue. Recent development activities on private land in the Town of Lincoln relate to primary and secondary homes, businesses, cross country ski trails and associated facilities and supporting roads. These areas have undergone repeated and continuing human disturbance resulting in the long-term loss of native plant communities and overall reduction in the biodiversity of the area. Recent development actions have probably not resulted in significant effects on biodiversity or on timber resources.

There would be continuing minimal loss of native vegetation on private land but not on such a scale that significant cumulative effect on vegetation resources or biodiversity is expected. Alternative B would result in negligible direct and indirect effects to vegetation resources. Consequently, the proposed action would not add any measurable cumulative effect when combined with other past, present or foreseeable future actions.

### *NNIS*

The Analysis Area for cumulative effects of non-native invasive species is the South Peak Learning Center project area as identified in Section 1.3 Project Area which includes private land owned by LMRC. The private property includes a mix of upland hardwoods, softwood, mixed-wood intermixed with wetlands, perennial and intermittent streams, and residential/commercial development. Any activity that involves ground disturbance or the movement of equipment from locations where NNIS occur to areas where they are not yet present has the potential to introduce and spread NNIS.

The temporal scope for cumulative effects of non-native invasive species is the past and future ten years (2004 to 2024). This considers temporary ground disturbing activity by project activities (vegetation beyond ten years will have re-established a sparse canopy and/or re-vegetated areas of soil disturbance making it unlikely that new infestations would be introduced by wildlife or human activity). This time frame also allows consideration of the forest-wide invasive plant inventory conducted by the New England Wild Flower Society (2001 - 2004) that covered 220,000 acres across the WMNF and adjacent lands, including

portions of the Cumulative Effects Analysis Area (USDA-Forest Service, 2005b, Chap. 3-154-155).

The cutting of the ski trails from forest and conversion to open grass areas has created the opportunity for NNIS to be introduced and become established. Existing trail maintenance activities including mowing and edge brushing may all increase the chance of NNIS spreading. Similarly, recreational mountain hiking on ski terrain and other recreational trails in the analysis area may contribute to NNIS spread along the trails because of continued soil disturbance in small areas.

Given that infestations of the five NNIS identified in the vicinity of the proposed project area are relatively small, adverse cumulative effects from the proposed action can be avoided through the implementation of Standards and Guidelines, as well as control efforts authorized in the 2007 White Mountain National Forest Forest-wide Invasive Plant Control Project Environmental Assessment.

Alternative A would not create any ground disturbance in the project area, and there is low risk of NNIS spreading from ongoing ski area operations. With the implementation of appropriate controls, it is unlikely that Alternatives A and B would substantially increase the cumulative risk of NNIS introduction and spread.

The proposed action would not add any measurable cumulative effect of introducing or spreading NNIS when combined with past, present and reasonably foreseeable future actions within the project area.

### **3.5 Wildlife Resources**

Wildlife resource concerns center around the potential for the Proposed Action to affect wildlife species, including breeding, nesting or foraging behaviors, as well as effects to their habitat. Project-related effects may stem from tree removal for ski trail and lift corridor development and/or disturbance related to ski area operations or increased levels of non-ski area recreational activities as a result of the ski trail improvements. Existing conditions in the project area and the potential effects of the Proposed Action as they relate to habitat and wildlife in general are discussed below. Potential effects to federally Threatened,

Endangered, and Proposed Species (TEPS) or Regional Forester Sensitive Species (RFSS) consisting of four species of woodland bats are discussed in Section 3.6.

### *Direct and Indirect Effects Analysis*

The analysis area for direct and indirect effects to wildlife and their habitat is the South Peak Learning Center project area as identified in Section 1.3 Project Area which includes private land owned by LMRC. The temporal scope for analysis of direct and indirect effects is the duration of ski trail and lift construction and 10 years into the future because this timeframe spans past and current WMNF Plans with S&Gs that have and would maintain wildlife trees including snags for wildfire habitat value.

### *Existing Conditions*

The habitat within the project area appears to be suitable for all common wildlife species expected to be present in these forest types and elevations on the surrounding WMNF. The only notable source of existing disturbance to wildlife and their habitat within the South Peak Learning Center project area appears to be the recreational and operational activities associated with the ski area. Cover, in the form of blowdowns and high stem-density regenerating stands was not abundant. Food for herbivores and omnivores, in the form of seeds, fruits, browse, and buds was common if not abundant, and available throughout the project area. Small mammals (such as mice, squirrels, and snowshoe hare) were present but not abundant, based on repeated winter tracking surveys undertaken using USDA-Forest Service winter tracking protocol (Squires et al., 2004). Multiple sources of surface water are available within the project area. (See Section 3.1)

### *Important Wildlife Habitats*

Normandeau surveyed for three types of specialized, species-specific habitats in 2011 and 2013. The presence and extent of deer wintering areas (DWAs) for white-tailed deer (*Odocoileus virginianus*) in the area was evaluated by observing forest stand type and structure, availability of browse species, and the presence of historic browse use and any sign of deer beds. No DWAs were identified in the project area. In general DWAs are located in coniferous stands with south

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trending aspects, at lower elevations (Bennett 2010). On-site coniferous stands are restricted to the hemlock drainage on the west side of the project area. Hemlock stands do provide preferred deer wintering areas, but no signs of current use was observed, and the historic browse scarring on smaller hemlocks was very minimal (Normandeau Associates, Inc. 2013c).

American beech (*Fagus grandifolia*) stands or inclusions representing high quality black bear (*Ursus americanus*) habitat are defined as those stands that exhibit bear scarring made within the past 10 years and include at least 15 to 25 scarred beech trees within a stand (Hamlin 2011). The density of bear-scarred beech (BSB) in the project area was evaluated. The hardwood cover on-site did not qualify as a beech stand, but beech was the co-dominant species with sugar maple and yellow birch. Extensive bear scarring was present on all larger beech trees, and light to moderate beech bark disease likely obscured additional scarring (Normandeau Associates, Inc. 2013c). The project area appears to provide good beech mast foraging habitat for black bears.

The presence and density of suitable roost trees for tree-roosting bats (large, tall, deciduous trees and snags with intact bark and moderate levels of decay and hollows) in the project area was evaluated within hardwood dominated and mixed forest portions of the project area. The South Peak Learning Center project area offers suitable roosting habitat for tree-roosting bats (Normandeau Associates, Inc. 2013c).

### *Ecological Indicators*

Peregrine Falcon (*Falco peregrinus anatum*): Peregrine falcon is a RFSS and a WMNF ecological indicator for cliff habitat since these birds nest on high cliffs or ledges often overlooking riparian habitats. Peregrines usually occupy the same cliff each year arriving back at the nest site between March and April. Medium-sized birds are the major food item taken by peregrine falcons. Falcons require an area with abundant prey. Because prey is taken in flight, openings may be beneficial, especially near riparian areas. There is no documented occurrence of breeding peregrine falcons and they are not expected to occupy the project area either now or in the future because there is no cliff nesting habitat. The adjacent existing ski trails and future forest openings created by the ski trails in the project

area may provide foraging habitat for hunting falcons that are nesting outside of the project area.

American Marten (*Martes americana*) is used as a WMNF indicator to assess effects on landscape-scale fragmentation of habitat connectivity (USDA-Forest Service 2005b). Marten are wide-ranging and utilize their entire home range daily which includes all habitat types and age classes though they prefer mature softwood. They are vulnerable to habitat changes. The South Peak Learning Center project area was surveyed for use by medium-sized forest carnivores and their prey species using snow tracking methods, based on a protocol developed by the Forest Service (Squires et al. 2004). Tracks from potential prey species were scarce throughout the project area, and only low numbers of mouse spp. and shrew tracks were observed. No marten tracks or trails were observed, but extensive fisher trails were observed during each of three tracking surveys conducted in February, 2013. The only other extensive track sets observed were coyote tracks.

#### ***Management Indicator Species (MIS)***

Potentially suitable habitat for one of the five WMNF MIS is present in the project area, the scarlet tanager (*Piranga olivacea*) which is typically found in mature hardwoods. Suitable habitat is not present for the other four species, consisting of magnolia warbler (*Dendroica magnolia*; regeneration age softwoods), blackburnian warbler (*Dendroica fusca*; mature softwoods) ruffed grouse (*Bonasa umbellus*; all ages of aspen/paper birch), and chestnut-sided warbler (*Dendroica pensylvanica*; regeneration age class hardwoods). Surveys of the area were conducted and none of these species was observed.

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

##### **Alternative A: No-Action**

Alternative A would have no effect on wildlife and their associated habitats. Changes to habitat in forested areas would occur primarily through natural events (e.g., natural forest growth, ice or wind damage, etc.). Terrain expansion may occur in the main Ski Resort SUP area, in accordance with the Loon Mountain 2002 EIS ROD, but this new terrain would be adjacent to and within

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existing ski trails, so no significant additional impact to wildlife would be expected. Snowmaking on areas outside of the project area would continue at current levels, therefore runoff and snow retention of slopes would be unchanged. Continuing maintenance activities would keep vegetation on ski slopes in its current condition, thus spring foraging opportunities for bears and use of the area by other wildlife throughout the year would be unchanged. There would be no effects to EIs, peregrine falcon, American marten, MIS, deer, bear, or other common wildlife species.

### Alternative B: Proposed Action

The Proposed Action would result in conversion of existing forested habitat, specifically 18.7 acres of tree clearing and temporary soil disruption for new ski trail clearing and 3.1 acres of tree clearing for lift lines. Of the 18.7 acres of tree clearing, the majority is in the northern hardwood which would cause a minor effect to scarlet tanager. None of these alterations would be so extensive that extant wildlife populations including the MIS, EIs, deer, bear and other common wildlife would not be able to shift foraging, nesting or mating behaviors to similar localized habitat within and adjacent to the project area. All disturbed trail areas would be regraded and seeded with an approved seed mix.

Collectively, these minor changes to habitat conditions would have minimal direct and indirect effects on wildlife, though there would be beneficial effects via increased foraging opportunities in open canopy areas. There would be no direct effect on the RFSS and ecological indicator peregrine falcon though new open canopy areas may provide a minor increase in the amount of foraging habitat. Likewise, extant wildlife populations coexist with ongoing recreational and operational activities, and would be expected to quickly acclimate to the incremental increase in these sources of disturbance and human presence as a result of the proposed action.

Alternative B might create a deeper and denser snow pack locally as a result of snowmaking on the expanded terrain, which in turn may result in extended runoff periods or delayed snow melt on slopes, as described in Section 3.1 Water Resources. Water withdrawal would not cause any direct, indirect, or cumulative effects on wildlife. Changes to the snow pack would, on average, result in a

somewhat delayed on-set of the growing season on the slopes. These changes could result in minor and short-term effects to the foraging quality of the ski slopes in early spring, but are not anticipated to substantially alter use of wildlife habitat by any species present including the EIs, MIS, deer, bear or other common wildlife species

### *Cumulative Effects*

The analysis area for cumulative effects to wildlife resources is the Loon Mountain Ski resort (Ski Resort), which includes the project area and private land abutting the Ski Resort (bounded by the East Branch Pemigewasset River to the north and by the WMNF boundaries to the east and west. This cumulative effects area includes the home range of the wildlife species that occur in the project area. Analysis of cumulative effects on wildlife and their habitat considered actions over the past last ten years, and actions that are reasonably foreseeable in the next ten years. For wildlife-related concerns, the 10-year timeframe is based primarily on the phenology of early-successional habitat. This cumulative effects analysis relates to wildlife resources and includes primarily analysis of conversion of habitat.

Recently developed or proposed projects in the cumulative effects analysis area that may potentially contribute cumulatively with the South Peak Learning Center Project are shown in Table 3.1-3. Recent and planned activities on NFS lands in the analysis area are limited to terrain expansion and terrain and vegetation management at Loon Mountain. For each of these projects, effects to wildlife, including peregrine falcon, American marten, deer, bear, and MIS and other common wildlife species have been avoided, reduced or minimized to the extent that they are not substantial.

Commercial, residential or industrial development on non-NFS lands exists within the analysis area. The primary development activity identified in Table 3.1-3 is the recent and continuing development of the South Peak Resort, a 365 acre development in the East Pemigewasset Valley and lower-most slopes of the South Peak area. These and adjacent private lands have contained roads, cross-country ski trails and scattered second homes for many years. Further additional

development activities on private land would have minimal effects on wildlife and their habitat.

Implementation of Alternative B would result in minor, localized, and short term direct and indirect effects to EI, MIS, deer, bear, and other common wildlife. Consequently, the proposed action would not add any measurable cumulative effects when combined with minimal effects from past, present and reasonably foreseeable future actions within the cumulative effects analysis area.

### **3.6 Threatened, Endangered and Proposed Species (TEPS) and Regional Forester Sensitive Species (RFSS)**

Concerns for species listed for Federal protection or that are listed on the Eastern Region (R9) Regional Forester Sensitive Species List center around the potential for the Proposed Action to affect species or individuals, including breeding, nesting or foraging behaviors, as well as effects to their habitat. Project-related effects to TEPS and RFSS may stem from tree removal, ski trail development and/or disturbance related to ski area operations or increased levels of non-ski area recreational activities as a result of the trail improvements.

A Biological Evaluation (BE) for plants and animals which are Federally-listed as Threatened, Endangered, and Proposed Species (TEPS) and/or on the Regional Forester Sensitive Species (RFSS) list was completed in March 2014, for the Proposed Action and the No Action alternative (USDA-Forest Service 2014). The process used and the sources examined to determine potential occurrence of TEPS or RFSS presence are listed in the BE, which is available in the project record. Conclusions about whether threatened, endangered, proposed and sensitive species and their habitat are known or suspected within the project area are based on best available science, literature reviews, database checks, and personal communications with professional biologists/botanists having local knowledge of the area and on multi-year site-specific field reviews.

#### ***Plants***

The analysis area for direct and indirect effects to RFSS plants and their habitat includes all of the direct disturbance area within the 77.5 acre South Peak Learning Center project area as identified in the BE and this EA (Figure 1.3-2).

This area is selected as it represents the area within which potential direct and indirect effects may occur if any species or habitat were present.

The timeframe for direct effects is the duration of project related, ground disturbing activity and for indirect effects when tree removal and soils disturbed by the project are substantially re-vegetated. The temporal scope is the past and future 10 years (2004-2024) which spans past and current WMNF Forest Plans with Standards and Guidelines that have and would protect soil, water, riparian, and plant resources.

### Existing Conditions

The RFSS list (USDA-FS 2012a) includes sensitive species of plants that occur on the WMNF. To determine which RFSS plants could be affected by the Proposed Action, a "Likelihood of Occurrence" (LOC) table was completed, and is available in the BE. In this table, all RFSS plants tracked by the WMNF are listed along with their status and a brief description of habitat requirements. These requirements were compared to existing habitat within the project area and existing data regarding habitat and species distribution. This comparison was then used to determine the likelihood of occurrence for each RFSS in the project area (Table 3.6-1). Based on the results of the pre-field review and the field reconnaissance, no TEPS plants and only three RFSS plant species were determined to have potential habitat within the project area. A field survey (Normandeau 2013b) found no RFSS plants in the project area. A full discussion of the environmental effects with regard to TEPS and RFSS plants and their habitat can be found in the BE, available in the project file.

### Direct and Indirect Effects

#### Alternatives A and B

Alternatives A and B would have no direct or indirect effects on TEPS and RFSS plant species. Based on a review of all available information, it was determined that there is no potential for the proposed action to affect any TEPS or any RFSS plants because none occur.

Any effects would be on species' potential habitats. Direct effects of Alternative B would include tree removal in proposed ski trails and the lift line corridors. Grading within the ski trails would further alter topography and disturb existing soils. No grading is proposed within the lift line corridors.

Alternative B would directly reduce the total acres of forest habitat currently within the project area by managing open areas for ski trails. The cutting of trees would indirectly increase sunlight reaching the forest floor adjacent to affected areas, which could benefit plants that compete well in open woods and clearings, but be detrimental to plants that compete well in deep shade. Similarly, the annual mowing of the ski trails would directly benefit plants adapted to open, disturbed conditions and adversely affect plants adapted to more stable, forest shade conditions.

**Table 3.6-1. Likelihood of Occurrence of RFSS Plants and/or Habitat within the South Peak Learning Center Project Area.**

Status	Species	Scientific Name	Likelihood of Occurrence
RFSS	Bailey's Sedge	<i>Carex baileyi</i>	<b>Low.</b> Disturbed wet ski slopes are potential habitat, although circumneutral conditions were not observed. Project area surveyed at appropriate time of year without discovery of any individuals.
RFSS	Northern Adder's-tongue	<i>Ophioglossum pusillum</i>	<b>Low.</b> Wet ski slopes are potentially suitable habitat for this species, but no individuals were observed during surveys.
RFSS	American Ginseng	<i>Panax quinquefolius</i>	<b>Low.</b> Rich mesic forests were absent in the project area. Semi-rich mesic sugar maple forest areas were searched but this species was not observed.

A decrease in capillary uptake of water by plants would occur due to trail clearing and may accelerate runoff or cause more wetland seepage habitats to form in the trails. Disturbance would be concentrated within the ski trails and minimize overall effects to vegetation, soil, and snow compaction. Creating more open disturbed areas could benefit species such as Bailey's sedge and northern adder's-tongue. The semi-rich mesic sugar maple forest that is marginally suitable for American ginseng habitat would not be affected by the expansion.

*Cumulative Effects*

The analysis area for this cumulative effects analysis is the 77.5 acre project area. This area was used because plants have a limited ability to transport themselves over great distances through seed dispersal. Unless populations are in close proximity to one another, actions affecting one population are unlikely to cause cumulative effects to multiple populations outside the analysis area. The Forest Service Manual (2670) provides direction to prevent loss of viability of Regional Forester Sensitive Species (RFSS) on the Forest or cause a trend toward federal listing. The determination of viability concerns for plants that are on the RFSS list was derived from data gathered during the Forest Plan revision process; thus, the temporal context for this analysis is from that date forward. The temporal scope is the past and future 10 years (2004-2024) which spans past and current WMNF Forest Plans with Standards and Guidelines that have and would protect soil, water, riparian, and plant resources.

Past, present and foreseeable future Loon Mountain activities within the 77.5 acre analysis area for cumulative effects have affected and would affect plant habitat. However, since there are no known RFSS plants within the cumulative effects analysis area, there would be no cumulative effects to plants from implementation of the Proposed Action.

**BE Conflict Determination:** Implementation of the No Action or the Proposed Action would cause “**no impact**” to the population or individuals of undiscovered RFSS-listed plants listed in Tables 3.6-1 and in the BE..

**Rationale:** Based on site-specific project area plant surveys and best available information from database and scientific literature reviews:

1. There are no documented occurrences of RFSS or TEPS plant species in the South Peak Learning Center project area.
2. Potential habitat may occur for three species within the South Peak Learning Center project area. Site work for the expansion could result in improved potential habitat for two species, Baileys’ sedge and northern adder’stongue. The rich woods with the potential to support American ginseng are outside of the project area.

Animals

The analysis area for direct and indirect effects to TEPS and RFSS animals and their habitat includes the Loon Mountain South Peak Learning Center project area as identified in the BE and EA Figure 1.3-2.

Existing Conditions

Bicknell's thrush (*Catharus bicknelli*), is a RFSS that is a passerine endemic to the Northeast, and breeds in high elevations in disturbed, fir-dominated forests. There is no suitable habitat for this species in the project area. Also, although the Loon Mountain South Peak Learning Center project area lies with the WMNF Lynx Analysis Unit 8, there is no mapped habitat for Canada lynx (*Lynx Canadensis*) within the project area. (See the Project BE Tables A-1 and A-2 for a complete description).

Several woodland bat species are known to occur on the WMNF. The federally-listed endangered Indiana bat (*Myotis sodalis*) does not occur on the WMNF, but the four species listed in Table 3.6.2 have been recorded across the WMNF during bat surveys conducted in the early 1990s and 2000s (Krusic et al. 1996; Sasse 1995; Chengler 2002, 2004). The eastern small-footed myotis (*Myotis leibii*), roosts in rock crevices, but the other bat species that occur on the Forest commonly roost in trees, most often in snags and partially dead trees near foraging habitat (or tri-colored bat in deciduous foliage), or little brown bat in buildings. Tree snags and foliage and rock crevice roosting habitat are available in the project area. The South Peak Learning Center project area provides suitable foraging habitat for woodland bats, and the surveys revealed that potential roost trees for tree-roosting bats are present throughout the analysis area.

Direct and Indirect Effects

**Analysis Area:** The Analysis Area for direct and indirect effects is the project area (includes private land) where on-site activities would occur. The analysis area for cumulative effects for woodland bats is the entire Loon Mountain Ski Resort and private land abutting the Ski Resort (bounded by the East Branch

Pemigewasset River to the north and the WMNF boundary to the east and west. This area was used because it:

- Encompasses the entire project area where activities would occur.
- Is large enough to include home ranges of woodland bats and addresses habitat connectivity and travel corridors to and from the project area, private land, and within ski resort boundaries.

**Table 3.6-2. Likelihood of Occurrence of TEPS and RFSS Animals and/or Habitat for the Project Area**

Species	Status	Habitat Requirements	Likelihood of Occurrence
Eastern small-footed bat <i>Myotis leibii</i>	RFSS	Uses caves, mines and old buildings for winter hibernacula. Uses rock outcrops and crevices in cliffs exposed to sun, buildings and bridges. Most likely forages in openings and along forest roads and wetlands.	<b>Low.</b> Existing ski slopes adjacent to and within the project area provide open foraging areas. Large glacial erratics with some exposure to sun potentially provide suitable roost sites, and nearby water features provide opportunities for bats to drink.
Little brown bat <i>Myotis lucifugus</i>	RFSS	Hibernates in abandoned caves and mines. Roosts in barns, attics, outbuildings, and tree cavities. Feeds over wetlands and still water.	<b>Low.</b> Existing ski slopes adjacent to and within the project area provide open foraging areas and expose hardwood trees and snags to the sun, creating suitable roosts, and nearby water features provide opportunities for bats to drink.
Northern long-eared myotis <i>Myotis septentrionalis</i>	USDI-FWS proposed endangered	Hibernates in caves with stable temperatures. Roosts in live, tall, hardwood trees with decay. Forages in the upper canopy.	<b>Low.</b> Existing ski slopes adjacent to and within the project area provide open foraging areas and expose hardwood trees and snags to the sun, creating suitable roosts, and nearby water features provide opportunities for bats to drink.
Tri-colored bat <i>Perimyotis subflavus</i>	RFSS	Hibernates in caves, mines, & other structures. Roosts in live or dead foliage of deciduous trees.	<b>Low.</b> Existing ski slopes adjacent to and within the project area provide open foraging areas, live or dead foliage of deciduous trees suitable for roosting, and nearby water features provide opportunities for bats to drink.

RFSS = Regional Foresters Sensitive Species list

- Addresses habitat diversity at the landscape level (includes streams, ponds, a mix of open and forested habitat, dirt and paved roads, developed areas, manicured lawns, and private land).

**Temporal Scope:** The temporal scope for the Proposed Action is the past and future 10 years (2004-2024) because this timeframe spans past and current WMNF Forest Plans with S&Gs that have and would maintain wildlife trees including snags suitable for roosting woodland bats on WMNF projects.

***Woodland Bat Species***

Tree felling could cause the direct effect of displacing a bat roosting in a tree, or possibly cause mortality of a roosting adult or a non-volant juvenile bat that cannot fly away (approximately June 1<sup>st</sup> - July 15<sup>th</sup>) during felling. If tree felling occurred outside of the bat summer maternity season (April 1<sup>st</sup> - September 30<sup>th</sup>) there would be no direct effects to roosting bats because they would likely be absent from the project area.

Potential roost trees for bats are present throughout the relatively very small project area (Normandeau Associates, Inc. 2013c). Indirect effects of tree removal would include a very minor reduction in the amount of roost habitat in the new ski trail and lift line locations. The amount of tree removal in the project area (approximately 21.8 acres) is only a minute portion of the entire 800,000 acre WMNF ( $21.8 \text{ acres} / 800,000 \text{ acres} = 0.0000272 \text{ acres}$  or .00272% of the entire 800,000 acre WMNF). Furthermore, using stringent northern long-eared bat roost tree criteria, Forest Inventory and Analysis data determined there are approximately 55 million live trees and approximately 13 million standing dead trees available to bats as roost habitat on the WMNF (Millen 2011). The relatively minor amount of proposed tree removal in the project area and the amount harvested across the WMNF annually (approximately 85,000 trees per year) is so minor compared to the large amount of roost tree habitat across the entire WMNF landscape. Therefore, the indirect effects would be negligible and immeasurable.

The Proposed Action may also have an indirect positive effect on some of the woodland bats because the new ski trails would create new linear flyways that could be used for travel and foraging. There would be no direct or indirect effects on winter habitat, as there are no documented caves within the project area.

*Cumulative Effects*

EA Table 3.1-3 and BE Table 5 shows the past, present, and foreseeable future projects within the analysis area within the temporal scope. There are no MA 2.1 lands within the cumulative effects analysis area, so no timber management has occurred or will occur. The non-MA 2.1 lands in the analysis area are not subject to timber management and large mature and overmature trees (potential woodland bat roosting habitat) would continue to dominate those areas and provide potential woodland bat habitat at the landscape level. Additionally, vegetation management, land development, and other activities have occurred or will occur within the temporal scope on private land with the analysis area, but private lands are also expected to contribute some potential roost trees at the landscape level.

An additional cumulative effects concern is White-Nose Syndrome (WNS). WNS has been detected in bat species from Canada to Tennessee to Oklahoma, including bats on the WMNF. Best available scientific information about WNS is available at: <http://www.whitenosesyndrome.org/>. Current multi-agency efforts aimed at preventing and slowing the spread of WNS are outlined in, “A National Plan for Assisting States, Federal Agencies, and Tribes in Managing WNS in Bats” (USDI-FWS 2011), and in the “Forest Service Eastern Region WNS Regional Response Plan, 2011-2012” (USDA-Forest Service 2011b). The WMNF is in close contact with the USFWS and NHFG, stays informed about WNS and takes appropriate actions. The majority of bats with WNS across the affected range have been found in caves where the bats hibernate. No bat hibernacula are known to exist on the WMNF, including the project area. Local and relevant surveys of several small caves throughout NH confirmed WNS present in caves located off the WMNF (NHFG 2010; Veilleux and Reynolds 2010; USDI-FWS 2008). Little brown bats collected at the Cog Railway near the WMNF (outside the project area) tested positive for WNS. Given the proximity of the WMNF to hibernacula and Cog Railway bats with WNS, it is likely bats using the WMNF have been or will be exposed to WNS.

The USDI-FWS (2005) concurrence letter on the WMNF Forest Plan BA stated the Forest Service must adhere to the WMNF Forest Plan Wildlife S&Gs for reserve

trees to cause no effect to all woodland bats during implementation of the revised Forest Plan (USDA-Forest Service 2005a). In 2011, WMNF biologists reviewed numerous clearcuts and evaluated the areas reserved with wildlife trees, and preliminary unpublished data indicates that forest-wide, the Forest is adhering to the FP S&Gs for maintaining wildlife trees (personal communication, Normandeau with WMNF Biologist Weloth). Past timber harvest and other activities on the WMNF did not add any additional stress to bats, as WNS was unknown prior to 2006-07.

In summary, WNS has not been linked in any way to activities proposed in the project area. No bat hibernacula have been found on the WMNF. All proposed activities would occur outside of known caves that are off-Forest, with no direct, indirect, or cumulative effects on hibernacula (USDA-Forest Service 2012b). The proposed action is not expected to meaningfully contribute to the cumulative effects of all other foreseeable actions in the analysis area over the next ten years, and would not alter the resources to irreversible or irretrievable commitments that might foreclose options to maintain viable populations of NLBs in New Hampshire.

**BE Conflict Determinations:** *The following determinations of effect were taken from BE completed for the Loon Mountain Ski Resort South Peak Learning Center Project.*

*Woodland Bat Species – USDI- FWS Proposed Endangered*

**BE Conflict Determination:** Implementation of the proposed action is “not likely to jeopardize continued existence or adversely modify proposed critical habitat” of the federally proposed endangered:

**Northern long-eared bat** (*Myotis septentrionalis*)

Under the No Action Alternative there would be lost opportunities to open the forest canopy and create favorable roosting, foraging, and/or flyway habitat along the ski trails for some woodland bats due to no tree removal in the project area at this time.

**Rationale:** This determination was based on best available local and relevant science and new information (USDA-Forest Service, 2010b, 2011c, 2012b) and on

## Loon Mountain Ski Resort South Peak Learning Center Project

site-specific project area field surveys (Normandeau 2013a), WMNF mist-net surveys (Chenger 2002, 2004; Yamasaki 2000), WMNF acoustic surveys (USDA-Forest Service 2009, 2010b, 2011c, 2012b), and recent cave surveys in NH (NHFG 2010, Veilleux and Reynolds 2010) and woodland bat roosting surveys (Veilleux 2005, 2006, 2007).

- 1.) Forest-wide mist net surveys of woodland bats (included similar habitat as found in the project area) detected NLEBs (Chenger 2002, 2004; Yamasaki 2004), thus likelihood of occurrence in project area is low due to very minor amounts of habitat and the reduced bat populations Forestwide.
- 2.) The proposed action would remove trees and vegetation for ski trail and lift construction and allow sunlight into adjacent areas, potentially removing some roost trees while simultaneously improving solar conditions for other roost trees, as well as creating open foraging habitat for some of the woodland bats.
- 3.) If tree-clearing for the proposed action occurs during the June 1 –July 15 period, some trees may potentially contain non-volant juvenile bats, creating a small possibility for direct effects to a limited number of individual young. However, if tree clearing takes place outside of the April 1<sup>st</sup> through September 30<sup>th</sup> bat summer maternity season, there will be no direct effects on bats including non-volant young as a result of the proposed action.
- 4.) Based on the large number of potential roost trees across the Forest (Millen 2011, USDA-Forest Service 2012b) and the reduced population of bats, the probability of a bat roosting in a tree being felled in the project area that could not fly away is extremely low. Furthermore, the Northern long-eared bat's range covered a relatively large area (habitat east of the Mississippi River, most of Canada, and some of the NW states) and the probability of a tree being felled in the project area housing the last bat within their entire historical range is very remote.

- 5.) There are no documented overwinter hibernacula (caves, mines, or tunnels) and no old buildings exposed to sun as roost sites (USDA-Forest Service 2005b, Appendix G, pages 224-227) within the project area.

***Woodland Bat Species – USDA-Forest Service RFSS***

**BE Conflict Determination:** Implementation of the proposed action “may impact individuals, but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species” of:

**Eastern small-footed bat** (*Myotis leibii*)

**Little brown bat** (*Myotis lucifugus*)

**Tri-colored bat** (*Perimyotis subflavus*)

Under the No Action Alternative there would be lost opportunities to open the forest canopy and create favorable roosting, foraging, and/or flyway habitat along ski trails for some woodland bats due to no tree removal in the project area at this time.

**Rationale:** Determinations were based on best available local and relevant science and new information (USDA-Forest Service, 2010b, 2011c, 2012b) and on site-specific project area field surveys (Normandeau 2013a), WMNF mist-net surveys (Chenger 2002, 2004; Yamasaki 2000), WMNF acoustic surveys (USDA-Forest Service 2009, 2010b, 2011c, 2012b), and recent cave surveys in NH (NHFG 2010, Veilleux and Reynolds 2010, and roost habitat surveys (Veilleux 2005, 2006, 2007).

- 1.) Forest-wide mist net surveys of woodland bats (included similar habitat as found in the project area) detected eastern small-footed, little brown, and tri-colored bat (Chenger 2002, 2004; Yamasaki 2000).
- 2.) The proposed action would remove trees and vegetation for ski trail and lift line construction and allow sunlight into adjacent areas, potentially removing some roost trees and simultaneously improving solar conditions for other roost trees, as well as creating open foraging and flyway habitat for some woodland bats.
- 3.) If tree-clearing for the proposed action occurs during the June 1 –July 15 period, some trees may potentially contain non-volant juvenile bats,

creating a small possibility for direct effects to a limited number of individual young. However, if the tree clearing takes place outside of the April 1<sup>st</sup> to September 30<sup>th</sup> bat summer maternity season, there will be no direct effects as a result of the proposed action.

- 4.) Based on the large number of potential roost trees across the Forest (Millen 2011, USDA-Forest Service 2012b) and the reduced population of bats, the probability of a bat roosting in a tree being felled in the project area that could not fly away is extremely small. Also, the three RFSS woodland bat's home range covered a relatively large area and the probability of a tree being felled in the project area housing the last bat within their entire historical range is very remote.
- 5.) There are no documented overwinter hibernacula (caves, mines, or tunnels) and no old buildings exposed to sun as roost sites (USDA-Forest Service 2005b, Appendix G, pages 224-227) within the project area.

### **3.7 Visuals**

The issue central to scenic resources concerns the degree of change that the chairlifts and trail clearings along with other project components would have on the views from nearby mountain or other vista locations, and whether the assigned Forest Service Scenic Integrity Objective would be met.

#### ***Forest Service Management Direction***

The quality of the visual environment or scenery is an important component in the management of NFS lands. Basic direction for scenery management is outlined in Forest Service Manual 2380. Forest Service policy calls for the National Forest to ensure that scenery is treated equally with other resources and scenery management principles are applied routinely in all National Forest activities (FSM 2380.3). The Forest Service manages scenic quality for the lands it manages by assigning Scenic Integrity Objectives (SIO) developed under the process described in *Agriculture Handbook 701, Landscape Aesthetics, A Handbook for Scenery Management*. The Scenery Management System (SMS) provides guidelines by which the quality of the scenic resource may be evaluated and then managed within the context of other resource management activities.

The resulting SIOs developed under the Scenery Management System establish a desired level of scenic quality and define the degree of acceptable alteration of the landscape resulting from human activity. The WMNF has completed the process for establishing SIOs and established specific standards and guidelines for scenery management in the current Forest Plan. The WMNF overall goal for scenery management states:

*“The White Mountain National Forest will conduct all management activities to be consistent with assigned Scenic Integrity Objectives, realizing the importance to local communities and Forest users of a natural-appearing landscape, distinct from the human-made environments dominant in the East”* (Forest Plan, Pages 1-16).

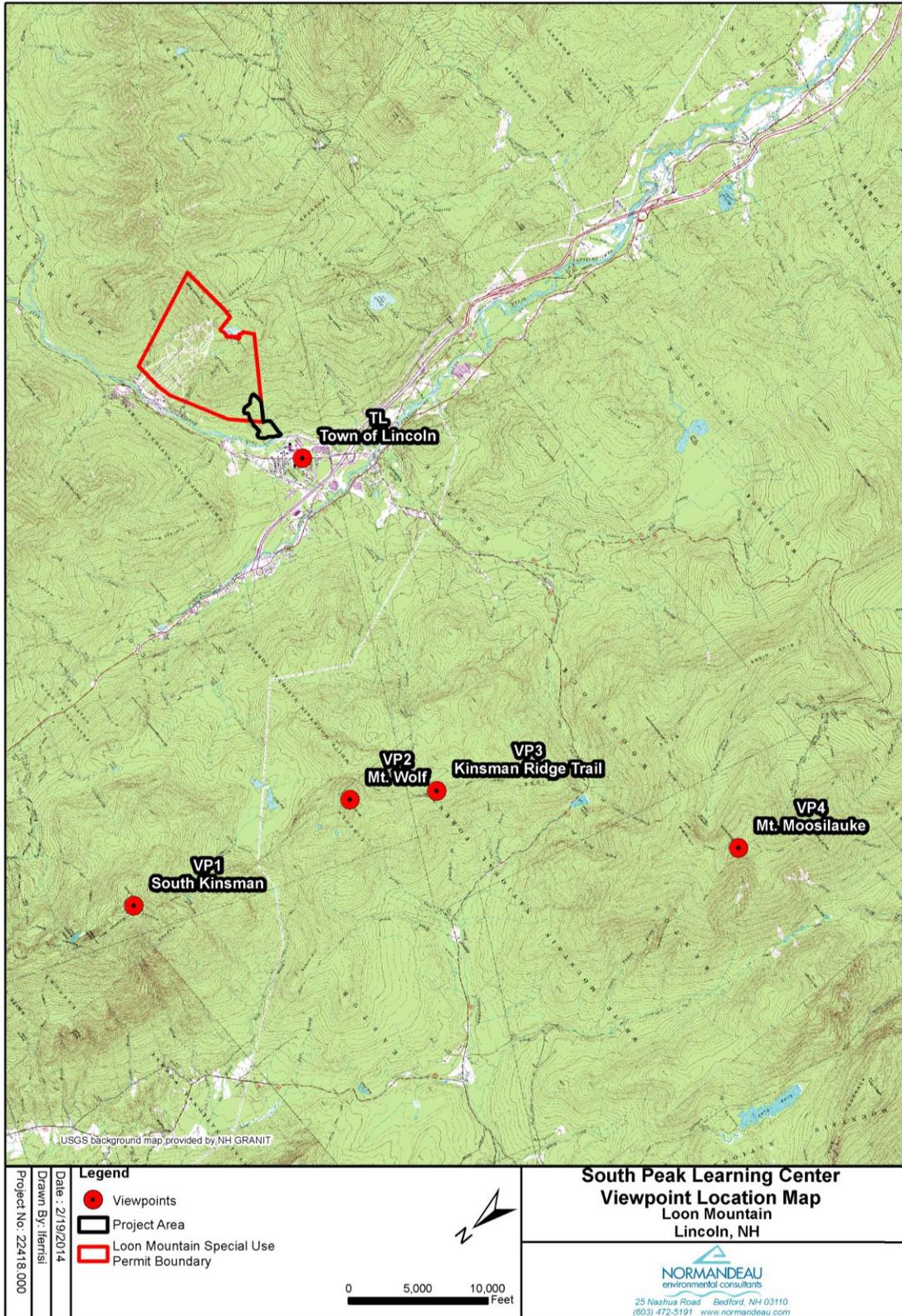
The levels of Scenic Integrity are defined in the SMS Handbook and in the Forest Plan (Forest Plan Glossary, Page 28). SIOs for the WMNF are assigned based on Scenic Class and Management Area (MA) combinations. For some MAs a single SIO is assigned based on MA desired condition factors or overriding management direction established through legislative or other land management directives. For MA 7.1 Alpine Ski Areas, which includes the South Peak Learning Center Project, the assigned SIO is Low (Forest Plan, Page 27). A Low SIO refers to landscapes where the valued landscape character appears moderately altered. Deviations begin to dominate the valued landscape character being viewed, but they borrow valued attributes such as size, shape, edge effect and pattern of natural openings, vegetation type changes or architectural styles from outside the landscape being viewed. For the adjacent landscape surrounding the ski area development or MA 7.1, the SIO is identified as Moderate. In these areas, the valued landscape character may appear slightly altered, but noticeable deviations should remain visually subordinate to the landscape character being viewed.

### ***Direct and Indirect Effects Analysis***

The analysis area for direct and indirect effects to scenic resources is shown in Figure 3.7.1. The South Peak Learning Center Project lies within a well-defined location at the base of the Loon Mountain South Peak Area. The project area encompasses existing trail development and, at the base, is adjacent to private

Loon Mountain Ski Resort South Peak Learning Center Project

developments associated with the South Peak Resort. However, the geographic scope for the scenic resources analysis encompasses a much larger area of influence to include all areas in which the proposed Project is potentially visible. This takes in viewpoints in the immediate Lincoln/North Woodstock area, including the town centers, area roads and highways, and from key vista locations associated with the numerous high elevation mountain peaks and hiking trails within a 10-mile radius that have views toward Loon Mountain, especially to the north and northwest of the project area. The slopes associated with Loon Mountain and the adjacent peaks and ridgeline serve as part of the backdrop when observed from these higher elevation National Forest trails and vista locations.



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Figure 3.7-1. South Peak Learning Center Viewpoint Location Map.

*Existing Conditions*

*Existing Visual Condition*

The Project lies on the northwest facing slope near the base of Loon Mountain's South Peak Area. Its boundary defines a small portion of the overall South Peak development. Visually, the general appearance of the project area is a forested slope, primarily northern hardwoods, with existing trail clearings. Landform is characterized by a slight ridge with an existing ski trail running down the center. For the most part, the proposed development will include expansion of this existing trail with new clearings for trails and lifts to either side. There are other existing trails within the immediate project area.

The Project is also directly adjacent to the base of the mountain, an area that includes a road, housing and condominium development, and other resort improvements. This portion of the South Peak development is adjacent to and lies to the southeast of the commercial developments within the Town of Lincoln. The forested slopes above and to the east of the project area include the main portion of the trails within the South Peak area. These trails along with two ski lifts have been a component of the landscape since 2007 when the South Peak area opened. The major portion of the Loon Mountain lies further to the west and reflects a dominant linear pattern of trails and chairlift lines on the slope below the North Peak of Loon Mountain.

The land on the slope to the west of the proposed Project, and outside the ski area permit boundary, is within the National Forest. Other than slight evidence of past timber management activity, this area has a character of natural appearing forested land.

*Visibility and Concern Levels*

Several tools were used to complete identification of potential view locations for scenic assessment of the proposed South Peak Learning Center Project. Initial identification was made using the Appalachian Mountain Club (AMC) White Mountain Guide topographic trail map to identify key peaks within a 10-mile radius of the Project location having trail access and with known viewing opportunities (particularly toward the proposed Project site). Viewing

opportunities selected from the map analysis were based on mountain peak descriptions in the Guide Book and from field knowledge.

Once locations were identified, they were further evaluated using Terrain Navigator mapping program. Using this program, actual distance from the view location to the center of the project site was calculated and a line-of-site profile constructed. The line-of-site profile identified whether the view was open to the project site or whether the view was likely blocked by intervening landforms. In addition, each of the potential views was evaluated using Google Earth imaging. For those sites with probable views, existing photographs were also reviewed in determining visibility of the project area.

Based on the topographic line-of-site analysis, Google image analysis, and other data reviewed, it was found that the majority of the potential view locations identified have views of the Project site (or that portion of the South Peak slope ) blocked by intervening landforms. This includes all peaks along the Franconia Ridge Trail running south from Mt Lafayette to Mt Flume that are north of the project area. It also includes those peaks that lie to the northeast of the site and that include Bondcliff and Mt Hancock.

There are a few high elevation viewing opportunities that lie to the west of I-93 and are situated to the northwest and west of the project site. Of the Kinsman Peaks, South Kinsman appears to be the most significant in affording an open view toward the project area. According to the AMC White Mountain Guide, Mt Wolf to the south of the Kinsmans also provides views to the east and the southeast. In addition, there is a location further south on the Kinsman Ridge Trail described as having views to the east. Further to the west, Mt Moosilauke also affords views of the project area. These points of viewing opportunity are all associated with the Appalachian Trail (AT).

Additional peaks evaluated for potential views included the smaller secondary peaks directly to the north of the project area. These include Big Coolidge and Whaleback Mountains, Potash Knob, and Mt Hitchcock. It was determined that these peaks do not have any designated or maintained trails to the top and are accessed primarily by bush whacking. Also, that the peaks are wooded without

views. In addition to the higher elevation locations evaluated, the area around the Towns of Lincoln and North Woodstock were also examined.

As a result of view location research, a few points were identified from which portions of the existing Loon Mountain South Peak area and the South Peak Learning Center Project are visible. (See viewpoint location map Figure 3.7.1). These specific locations are listed and described below. For each, the concern level and distance zones are also provided. Concern levels are a measure of the degree of public importance placed on landscapes viewed from travelways and use areas. They are identified under the Scenery Management System as level 1 (high), 2 (moderate), and 3 (low). Distance zones are defined as foreground (observer to ½ mile away), middleground (½ mile to 4 miles from the observer), and background (4 miles to infinity from the viewer). Locations having views toward the project area and identified for further assessment are:

***Viewpoint 1 – South Kinsman Mountain***

Of the two Kinsman Mountain peaks (North and South), South Kinsman offers the most open and dominant view toward Loon Mountain and is the primary peak that is used for assessment of visual effects. North and South Kinsman Mountains are 4000' peaks (Elevation 4293' and 4358' respectively) located on the Appalachian Trail in the WMNF. The peaks lie above the AMC Lonesome Lake Hut and are popular hiking destinations. The Kinsman Ridge Trail (AT) crosses both peaks and can be accessed by trails originating in Franconia Notch on the east side and by the Kinsman Trail from Highway 116 on the west side.

Although North Kinsman offers good views from ledge areas near its summit, its peak is mostly wooded. In contrast, the broad flat summit of South Kinsman has more opportunity for open views, especially to the southeast toward the Project site. It offers an extensive panoramic vista that takes in the Franconia Ridge, Scar Ridge, Mt Osceola, Mt Tecumseh and other peaks further to the west (See Figure 3.7.2). While the vista from South Kinsman Mountain is extensive and encompasses natural appearing views of the surrounding landscape, the view also includes cultural developments that consist of several miles of the I-93 corridor; the towns of North Woodstock and Lincoln (roads, building structures and openings related to these facilities); and the extensive network of ski trail



VP 1 – South Kinsman\_Existing Condition Photo  
Photo Source: <http://www.flickr.com/photos/smanyamo/8160737256/>



Data SIO, NOAA, U.S. Navy, NGA, GEBCO  
Image Landsat  
Image USDA Farm Service Agency

VP 1 - South Kinsman\_Simulation of South Peak Learning Center Terrain Project

Date : 2/19/2014  
Drawn By: Ilerisi  
Project No: 22418.000

**South Peak Learning Center  
Viewpoint 1: South Kinsman Mountain  
Loon Mountain  
Lincoln, NH**



25 Nashua Road Bedford, NH 03110  
(603) 472-5191 [www.normandeau.com](http://www.normandeau.com)

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**Figure 3.7-2. Viewpoint 1– South Kinsman Mountain.**

and chairlift openings associated with the Loon Mountain. This includes both the North Peak development that has been a part of the viewed landscape since it opened in 1966 and the development at South Peak that opened in 2007. Except for the project area, the immediate base area of the Loon Mountain development cannot be observed as it lies behind an intervening ridge.

South Kinsman Mountain is inventoried as a concern level 1 feature and the viewing distance to the mid-point of the South Peak Learning Center project area is approximately 6.7 miles (Background view).

### *Viewpoint 2 – Mt. Wolf*

Mt Wolf is a 3500' peak that lies along the Kinsman Ridge Trail (Appalachian Trail) north of Kinsman Notch. Mt Wolf can also be accessed by the Gordon Pond Trail that originates off Highway 112 closer to North Woodstock. The AMC Guide indicates there is "a side path leading off the Kinsman Ridge Trail 60 yards to the summit of the east knob, where there is a fine view of the Franconia's and the peaks to the south and southeast." This view orientation would likely take in the project area.

The extent of the view is dependent on its actual location and elevation which is not specifically identified on a trail map. A viewer position near the peak of Mt Wolf would allow for views of the project area. Due to an intervening landform, view positions below the peak would start to diminish the view of distant lower elevations (that would include the project area) while still allowing views of higher mountain peaks. Image analysis did not identify any open ledge areas which suggest an opening through the trees, which may also limit the breadth of the view.

At elevations near the peak of Mt Wolf, image analysis shows the cultural developments within the view are similar to those observed from South Kinsman. The intervening landform reduces the amount of the North Woodstock area in the view while more of the east end of Lincoln and the base of the Loon Mountain development (and South Peak) are visible. In addition to these cultural features, there is a power line corridor that lies between Mt Wolf and the Project site that would be observed.

Mt Wolf (East Knob) is a concern level 1 feature and the viewing distance to the mid-point of the South Peak Learner Terrain project area is approximately 5.1 miles (Background view).

***Viewpoint 3 – Kinsman Ridge Trail***

The AMC Trail Guide states that two good outlooks exist on the Kinsman Ridge trail (Appalachian Trail) 2.4 miles hiking distance from Kinsman Notch. The easterly view orientation indicated in the guidebook would likely take in the project area. Similar to Mt Wolf, the exact location of the view is not specifically identified on a trail map. Image analysis did not identify any open ledge areas along this ridge which suggest an opening through the trees. This may limit the breadth of the view. Image analysis shows the cultural developments within the view are similar to those described for Mt Wolf. At this location there is not an intervening landform that would diminish views of distant lower elevations increasing the probability that the project area is within the view. The trail along this ridge is approximately 3000 feet in elevation. Kinsman Ridge Trail is a concern level 1 feature and the viewing distance at the view location analyzed to the mid-point of the South Peak Learner Terrain project area is approximately 5.5 miles (Background view).

***Viewpoint 4 – Mt Moosilauke***

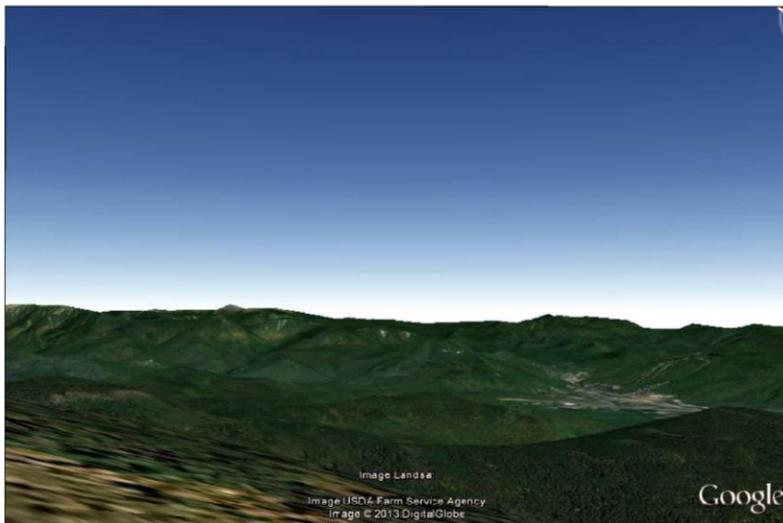
Mt Moosilauke (4802') is also located on the Appalachian Trail. Its summit is accessed by numerous trails with one of the most popular trailheads located at the end of Ravine Lodge Road, the access road to the Dartmouth Outing Club Ravine Lodge situated at the base of the mountain. Mt Moosilauke has a bare summit that provides for panoramic views in all directions and is a popular hiking destination (See Figure 3.7.3).

The project area lies in the distant background to the east. The extensive panoramic view of the White Mountains in this direction takes in the Towns of North Woodstock / Lincoln and their associated developments (roads, building structures and openings related to these facilities); segments of the I-93 corridor; and several of the ski trail clearings at Loon Mountain, primarily the South Mountain area. Detail of cultural features at this distant is difficult to perceive.



VP 4 - Mt Moosilauke\_Existing Condition Photo

Photo Source: <http://www.flickr.com/photos/nhptv/3833688067/sizes/o/m/photostream/>



VP 4 - Mt. Moosilauke\_Simulation of South Peak Learning Center Terrain Project

Date : 2/19/2014 Drawn By: Itensil Project No: 22418.000	<b>South Peak Learning Center                  Viewpoint 4: Mt. Moosilauke                  Loon Mountain                  Lincoln, NH</b>
	 25 Mashua Road Bedford, NH 03110 (603) 472-5191 www.normandea.com

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**Figure 3.7-3. Viewpoint 4 - Mt Moosilauke**

## Environmental Assessment

Mt Moosilauke is inventoried as a concern level 1 feature and the viewing distance to the mid-point of the South Peak Learner Terrain project area is approximately 8.7 miles.

### *Town of Lincoln*

Throughout Lincoln there are numerous partial views of the upper portion of the project area. The more open public locations that have potential partial views of the proposed ski trail and lift line clearings occur along Main Street (NH Rte. 112), over the roofs of commercial buildings or across parking lots associated with these buildings. The most prominent of these partial-view opportunities occur at the Main Street intersection with Connector Road (Figure 3.7-4), across the parking lot next to the Town Administrative Offices, and a location at the east end of town, again looking over the roof of a commercial building (Figure 3.7-4). Partial views may also occur throughout the residential area north of Main Street.

Modeling indicates the most dominant view of the project from Main Street would occur at the Connector Road/Main Street intersection which is located to the west of the project area. In this view, proposed trails and lift clearing would be partially visible on the lower landform that is evident when looking over the left end of the long build on the other side of Main Street. One of the clearings on this landform would be Lift B (See Figure 1.3-3) and some visibility of lift towers near the upper terminus of the lift would be likely. Some visibility of lift towers associated with Lift A may occur on the lower landform in the view across the parking lot located at the Town Administrative Offices. Visibility of lift towers could potentially occur at the other locations but for the most part they will be screened from view by a combination of intervening vegetation and viewer orientation, especially as one moves toward the east end of town. Where viewed, they would be observed against a background of trees or a forested slope and would not be out of character with existing views of the South Peak area from Main Street. The visual treatment of lift towers is outlined in Forest Service Scenery Management Handbooks. Lift towers proposed for this project would meet these requirements to minimize impacts.

Loon Mountain Ski Resort South Peak Learning Center Project



Highway 112 Intersection – Clearings would be visible on low landform viewed over roof toward left end of long building.



Highway 112 / East end of Lincoln – Clearings would be visible on low landform viewed over roof toward right portion of building.

Date : 2/19/2014  
 Drawn By: Ferrisi  
 Project No: 22418.000

**South Peak Learning Center  
 Town of Lincoln Viewpoints  
 Loon Mountain  
 Lincoln, NH**

**NORMANDEAU**  
 environmental consultants  
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**Figure 3.7.4. Town of Lincoln Typical View Positions**

*Direct and Indirect Effects*

*Alternative A: No-Action*

Alternative A would be consistent with the assigned the Scenic Integrity Objective of Low. No new ski trails, chairlifts, building construction, or other Project components would be constructed under the No Action alternative, beyond those that are currently approved, but not yet constructed. Therefore, this alternative would not have any adverse effects on scenic quality, since the existing conditions in the project area would remain unchanged.

*Alternative B: Proposed Action*

Direct and indirect impacts of Alternative B on scenic resources are anticipated to be minimal and would be consistent with the assigned Scenic Integrity Objective of Low. In completing the assessment of the effects of the proposed South Peak Learning Center project, simple simulations were completed for two key viewpoints using Google Earth Pro. The illustrations were created to approximate the view represented in the actual on-site viewpoint photographs for South Kinsman and Mt Moosilauke (Figures 3.7-2 and 3.7-3). The simulation for South Kinsman also serves as a reference for Mt Wolf and Kinsman Ridge Trail viewpoints. In addition, photos for typical view positions for the Town of Lincoln are also provided for reference (Figure 3.7-4).

Although the NEPA process and development of this EA precedes development of final engineering plans providing details of chairlift tower heights, it is noted here that typically such towers for these types of lifts do not exceed 40 feet in height. In this case, where Lift A would cross Lift B (see Figure 1.3-3), tower height would approach but not exceed 50 feet for a couple of Lift A towers on either side of Lift B. These slightly taller towers have been considered in this analysis. For in-town views around Lincoln lift towers may be visually evident, as noted above. At the background viewing distance of the other viewpoints analyzed, their visible evidence would be low, and it would be difficult to discern them in the view. The proposed base lodge located on private land would likely have some visibility in the view but its low position in the landscape would minimize and generally eliminate its visual presence, especially

for view locations around Lincoln. Simulations provided were designed to show clearing for all activities.

In addressing the issue outlined for scenic resources, two indicators are used. The first is the degree of change to the existing character of the viewed landscape as viewed from the identified viewpoints. The second indicator is the degree to which the proposed expansion will meet the SIO of Low.

#### ***Viewpoint 1 – South Kinsman Viewpoint***

Of the four background viewpoints identified, the view angle and orientation from South Kinsman creates the ability to view all of the project area. The simulations completed for this view (Figure 3.7-2) show that most all Project trail and chairlift clearings would be visible in the view and add to the extent of the overall ski area development visible. However, the project area comprises a very small and minor part of the extensive landscape viewed from this location. Also, the background viewing distance minimizes the ability to discern specific detail of lift towers and similar project elements.

The clearings resulting from the proposal are similar in character to the existing trail and lift line clearings. Their low position at the base of the slope allows them to fit in as an ordinary component of the existing ski area and adjacent town development. They do not stand out as an add-on feature. Considering the viewing distance, the extensive amount of cultural development existing within this view, and the resulting appearance/character of the trail and lift line clearings, the SIO of Low will be achieved for the South Kinsman view.

#### ***Viewpoint 2 – Mt. Wolf***

Although the view distance is closer for Mt Wolf as compared to South Kinsman (VP 1), it remains a background view and the resulting effects are similar to those described for VP 1 (See VP 1 effects description above). While the trail and chairlift clearings will be visible they remain a very small part of the landscape viewed from this position and appear as an ordinary component or extension of the existing ski area development. Considering the viewing distance, the extensive amount of cultural development existing within this view, and the

resulting appearance/character of the trail and lift line clearings, the SIO of Low will be achieved for the Mt Wolf view.

***Viewpoint 3 – Kinsman Ridge Trail***

This background view location is 0.7 mile to the southwest of Mt Wolf and approximately 500 feet lower. Image analysis shows the effects to be the same as VP 2 – Mt Wolf (See VP 2 (and 1) effects description above). Considering the viewing distance, the extensive amount of cultural development existing within this view, and the resulting appearance/character of the trail and lift line clearings, the SIO of Low will be achieved for this AT ridgeline view.

***Viewpoint 4 – Mt. Moosilauke***

At 8.7 miles distance this view location is a distant background view and detail relative to the cultural features observed becomes difficult to distinguish (Figure 3.7-3). The view direction and orientation toward the project area is slightly to the northeast. At the distance involved, along with the extensive landscape viewed, the cultural features observed (North Woodstock / Lincoln, I-93 Corridor, portions of the existing ski area) are a lesser part of the total landscape compared to the other background views analyzed. While the proposed project will be noticeable, the degree of change it produces is very small and the change will be difficult to distinguish. In addition, there is a portion of the proposed project area where the slope begins to fall away from the observer and/or the clearings are oriented broadside to the observer. Clearings in that portion of the development would become less visible in the view.

The clearings and lift towers resulting from the proposal and that would be viewed are similar in character to the existing trail and lift line clearings and towers. Their low position at the base of the slope allows them to fit in as an ordinary component of the existing ski area and adjacent town development. They would not stand out as an add-on feature, especially considering Forest Service Scenery Management guidance for tower materials and colors. Considering the viewing distance, the amount of cultural development existing within this view, and the resulting appearance/character of the trail and lift line clearings, the SIO of Low will be achieved for the Mt Moosilauke view.

### *Cumulative Effects*

The analysis timeframe for cumulative effects to scenic resources is 30 years before and 20 years forward for time, and the analysis area is the same as that for direct and indirect effects as presented in Figure 3.7-1. Other projects in the area that could contribute to cumulative impacts to the scenic resource include management activities such as timber sales or other vegetation management activity, recreation construction projects, residential and commercial development, utility right-of-way clearings, or future additions to the ski area. At this time the only known proposed project in the immediate area or in proximity of the South Peak Learning Center Project of a scale that could have a substantial effect on scenic resources is the South Peak Resort development. However, this development is occurring in the valley and on the very lowest slopes of the South Peak area which makes its potential impact to scenic resources negligible. Furthermore all management activities on the WMNF must meet standards and guidelines that achieve established Scenic Resource Management Objectives. Consequently, the proposed Loon Mountain South Peak Learning Center would not add any measurable cumulative impact when combined with recent past, present and reasonably foreseeable future actions within the project area.

### **3.8 Recreation Resources**

The issues central to recreation resources (specifically winter recreation) come directly from the Purpose and Need for the proposed action, as described fully in Section 1.5 Introduction; briefly, the project is proposed in order to increase beginner/learner terrain at a dedicated learning center to reduce overcrowding, thereby improving both the quality of the skier/boarder experience and associated skier/boarder safety.

#### *Direct and Indirect Effects Analysis*

The analysis area for recreation resources focuses on the public and private lands in the immediate Loon Mountain area where winter recreation occurs, namely the 1,366-acres contained in the resort's Special Use Permit, the Town of Lincoln, and any adjacent lands that may also support winter recreation.

*Existing Conditions*

The Forest Service's purpose in issuing a ski area SUP is to increase the diversity and quality of recreational opportunities provided on NFS lands. The Forest Plan contains goals and objectives for providing a diverse range of high-quality, sustainable recreational opportunities that complement those provided on non-NFS lands. Plan direction for alpine ski areas, including the project area, is described by Management Area (MA) 7.1 which emphasizes highly developed recreation. The purpose of MA 7.1 is to provide opportunities for recreation requiring highly developed structures and facilities, while maintaining a visually appealing landscape and managing for other resource uses in a compatible way. The SUP authorizes use of 1,366 acres of NFS lands for a four season resort at Loon Mountain. Loon Mountain has operated under an SUP since the 1960s; the current SUP was issued in 2012 and expires in 2046.

Loon Mountain is situated in proximity to major population centers such as Boston, Montreal, and New York and is popular for not only its accessibility but for the range of recreation opportunities it provides. Most importantly, alpine skiing/snowboarding and other winter-season resort activities are provided to the public. There are approximately 370 skiable acres at the resort which encompass the following features: 61 maintained trails, seven tree skiing areas and seven terrain parks including a 425-foot superpipe and a mini-pipe. With the exception of the deficiencies discussed previously, the trail and terrain network accommodates a range of ability levels from beginner to expert for both skiers and riders at Loon Mountain as a whole.

*Direct and Indirect Effects*

*Alternative A: No-Action*

Alternative A would have no effect on improving recreation for beginner skiers and boarders at Loon Mountains. With no increase in lower ability level terrain, it is expected that utilization at Loon Mountain's existing learning terrain would continue to face overcrowding, diminished skier experience and eventually reduced visitation to the ski area. Loon Mountain could continue to develop terrain in the main resort area, consistent with the Loon Mountain 2002 EIS ROD,

but this terrain is all intermediate or expert terrain which would do nothing to improve conditions for learning skiers.

*Alternative B: Proposed Action*

Alternative B would have positive direct and indirect effects on recreation resources. The Proposed Action is designed to meet the project purpose and need as provided in Section 1.5 Introduction. Loon Mountain proposes to create a network of thirteen ski trails as part of their South Peak Learning Center expansion project. In addition to the new ski trails, this proposed action would entail the construction of two fixed-grip quad chairlifts and two Magic Carpet® conveyor surface lifts comprising 18.7 acres of new and 6.6 acres of existing beginner/learner terrain. Existing snowmaking capacity is sufficient to meet the snowmaking demand of the Learning Center.

The resulting increase in ski terrain would help address the existing deficit in beginner and novice terrain. Increased terrain at the South Peak Learning Center would enhance the quality and safety of the skiing experience and visitation levels would be expected to continue.

Alternative B would help meet the Forest Plan goal to provide a diverse range of high quality, outdoor recreational opportunities that complement those provided off NFS lands, since an increase in quality ski experience would be provided on a more consistent basis.

Visiting skiers typically adopt the 6-8-10 principle, whereby they spend approximately 6 hours skiing, 8 hours sleeping, and up to 10 hours pursuing alternative recreation. Implementation of Alternative B would be expected to result in a slight increase in average annual alpine skiing visitation to Loon Mountain's South Peak Learning Center. Accordingly, while no significant change in peak demand levels would be expected, the average demand for other winter recreation activities such as Nordic skiing, snowshoeing, ice-skating, sleigh rides, dining and shopping would likely increase slightly within the immediate area

*Cumulative Effects*

The analysis area for cumulative effects is the same as that for direct and indirect effects analysis. The timeframe for this analysis is 20 years prior and 40 years after implementation of the Proposed Action. The forward looking portion of the timeframe is consistent with the 40-year term of Loon Mountain's SUP. As stated previously, the current SUP was issued in 2014 and expires in 2054.

Loon Mountain officially opened on December 27, 1966 (Fleming 2009) and has since had steady growth. By the mid-1980s, Loon had approximately doubled its skiable terrain and grew tenfold from its first open season of 30,000 visitors to 340,000 visitors (Fleming 2009). Since the late 1980s, skier visitation trends at Loon Mountain have been relatively stable, with numbers peaking during weekends and holidays.

In 2002, Loon Mountain received approval for expansion onto South Mountain Expansion for use of an additional 581 acres. Loon Mountain had concluded that there was an increased demand for additional skiing and that additional guest capacity was needed at the Loon Resort (Fleming 2009). With Loon providing sufficient skier experience, it allows the facility to compete with neighboring New England ski areas. To accommodate this, Loon Mountain has expanded and made changes within the SUP boundary areas in order to maintain trails and equipment such that the visitor experience is a positive one.

Table 3.1-3 lists projects that have occurred or have the potential to occur within the analysis timeframe and analysis area and have the potential to add cumulatively to the effects on winter recreation resources. Some of these projects have affected or will affect winter recreation resources in a positive way as identified in their respective permitting documents. Loss of the South Peak XC ski trails has negatively affected cross-country skier opportunities.

The Proposed Action would improve the learning experience for beginning skiers and others who would take advantage of the new South Peak portal. Improved visitor experience may lead to increased or longer duration visitation in the greater Lincoln area. While it is not anticipated that large-scale new development would result directly from the implementation of the action alternative, it is expected that development activities, including businesses,

seasonal homes and permanent residences, would result in the surrounding area largely as an indirect result of the project. Effects to recreation resources from this development are expected to be positive and consistent with historic levels of recreation.

In the foreseeable future, it is expected that demand for recreation opportunities will continue to grow and existing and future recreational facilities will meet that demand. Implementation of Alternative B is not expected to increase peak visitation beyond those levels currently permitted, but the expansion would provide the beginner/learner group with an improved skier experience and also accommodate an increasing demand from this important group. Visitation at the ski area may also increase demand for other winter recreation activities elsewhere in the area including snowshoeing, winter hiking, cross country skiing, sled dog excursions and ice skating.

The Proposed Action would add measurably to the positive cumulative recreation effects when combined with recent past, present and reasonably foreseeable future actions within the project area.

### *Alpine Skiing in a Globally Warming Environment*

The climate model results and the predicted temperature increases discussed in Section 3.1 Water Resources suggest that the numbers of skiable days may decline perhaps 10 to 20% annually and that the economically critical Christmas/New Year's holiday period may be increasingly affected. Smaller, less highly capitalized ski areas (and snowmobile and Nordic centers) unable to invest significantly in adaptive capacity technologies such as snowmaking infrastructure may be particularly pressured, especially those at lower elevations or in the southern portion of the state. Under a higher greenhouse gas emissions scenario, one study suggests that only four out of fourteen major northeast ski resorts would remain profitable by 2100 (Burakowski and Magnusson 2012). Another study found that only 35 of the Northeast's 103 current ski areas could remain economically viable by 2099 (Dawson and Scott 2013), again under the higher emissions scenario. These studies identified Loon Mountain as one of the ski areas expected to remain financially viable.

With expected effects of climate change, some level of warmer winter temperature and decreased natural snowfall will affect ski resorts for the foreseeable future. Resorts will need to adapt to remain competitive and viable. Expanded snowmaking systems are expected to provide acceptable mitigation for many of the larger and more northerly ski areas, including Loon Mountain (Dawson and Scott 2013). The timing and intensity of changes in temperature and snowfall from global climate change vary among the models. With the potential for improvements in snowmaking technologies to help the industry adapt to these changes, the need for increased snowmaking coverage is not presently quantifiable for analysis. Nevertheless, these studies indicate that skiing in Northern New England and specifically at Loon Mountain will remain viable into the foreseeable future. Thus, it can be concluded that climate change concerns are not sufficient to negatively affect the feasibility of the South Peak Learning Center project.

### **3.9 Socioeconomic**

Implementation of the Proposed Action is important to the economic stability of the Town of Lincoln and the surrounding communities. By responding to a demonstrated demand for additional beginner/learner terrain, the project would increase options for beginner and novice users, alleviate overcrowding at the existing learning area and improve overall safety, thereby enhancing visitor experience.

#### *Direct and Indirect Effects Analysis*

The direct and indirect socioeconomic effects analysis area focuses on the greater Lincoln area and, to a lesser extent, the rest of Grafton County. Direct and indirect effects would predominately occur within the immediate area while secondary impacts would occur further out within the surrounding community. The direct and indirect effects are described for a period of 40 years from project implementation, which is consistent with the term of Loon Mountain's SUP.

*Existing Conditions*

*Existing Development and Population*

Loon Mountain Ski Resort (Loon Mountain) is located in Lincoln, New Hampshire, off Interstate 93 at Exit 32, on the western end of the scenic Kancamagus Highway (Route 112) in Grafton County. Loon Mountain is a four-season resort with many recreational opportunities operated primarily on National Forest System (NFS) lands on the Pemigewasset Ranger District in the White Mountain National Forest (WMNF). Lincoln is the second largest town in land area in the state and Loon Mountain is an important part of the economy as it provides a variety of amenities. The success of Loon Mountain influences the economy of the Town.

The population of Lincoln increased rapidly during the middle to late 1980s, paralleling the expansion of Loon Mountain and the booming economic conditions during that time as the town transitioned from a mill town into a resort community. Much of the development has been multi-family units such as condominiums, motels, and timeshares and commercial development. Most of the commercial development has occurred along the Main Street / Route 112 corridor resulting in a pattern of strip development rather than the more centralized development patterns of traditional New England towns (USDA-Forest Service 2002).

New Hampshire was the fastest growing of the Northeast states for the past four decades, reflecting the changing employment and economic picture of the state (NHOEP 2009). Population growth has slowed considerably since 2000. This was a national trend, with the national population growth rate decreasing, but that decrease was even larger in the Northeast states, again, reflecting national and regional changes in economy and employment opportunities (NHOEP 2009).

According to the New Hampshire Office of Energy and Planning (NHOEP 2013), there were approximately 1,662 residents in the town of Lincoln in 2012. During peak ski season, the town experiences influxes of visitors on peak weekends and holidays. Historic and current population data for the Town of Lincoln are presented in Table 3.9-1.

**Table 3.9-1. State, County and Town Population Estimates**

	Population 2000	Population 2010	Population 2012	% Change from 2000
New Hampshire	1,235,550	1,316,256	1,321,000	6%
Grafton County	81,740	89,118	89,742	9%
Lincoln	1,271	1,662	1,662	24%

Source: NHOEP, 2012 Population Estimates of New Hampshire Cities and Towns Report. July, 2013.

\*Note: Population of unincorporated places not included in this report

***Historic Population Change of the Town of Lincoln***

Loon Mountain has played a key role in stimulating population growth in the Town of Lincoln. In 1960, the town’s permanent population was 1,228 residents and the largest decennial percent change was a 31 percent increase between 2000 and 2010 and a 24 percent increase for the entire 12-year period presented above.

***Housing***

Characteristics of the housing supply in Lincoln are presented in Table 3.9-2, along with housing numbers for New Hampshire and Grafton County for comparison.

**Table 3.9-2. Housing Supply Characteristics 2000-2009**

	Total Units 2009 (change from 2000)	% change from 2000	Single Family 2009 (change from 2000)	Multi-Family 2009 (change from 2000)	Manufactured Housing 2009 (change from 2000)
New Hampshire	611,339 (64,815)	12%	386,937 (46,059)	185,197 (15,069)	39,205 (3,687)
Grafton County	49,572 (5,844)	13%	30,574 (3,682)	14,809 (1,635)	4,191 (527)
Lincoln	2,599 (284)	12%	632 (111)	1,877 (144)	90 (29)

Source: NHOEP 2009

Housing growth between 2000 and 2009 was virtually identical in the Town of Lincoln to that New Hampshire and surrounding Grafton County, although a much greater percentage of Lincoln’s growth came from multi-family dwellings.

Data delineating the difference between year-round and vacation homes is not readily available for the Town of Lincoln, although it can be assumed from a comparison of the number of housing units to the Town’s population data that a large percentage of housing units within the Town are not used for year-round habitation.

***Employment and Spending***

Employment and wage data are presented in Table 3.9-3. Grafton County has exhibited substantial economic growth over the last decade, more so than any of the other New Hampshire counties (NHELM I 2013). Within the last twelve years (2000 and 2012), employment grew by 5.8% for Grafton County but only 1.1% for the State of New Hampshire. The growth in Grafton County during this time was primarily a result of increases in the health care sector, agriculture, forestry and other land management, transportation and warehousing. However, economic growth in Lincoln during this time demonstrated a 6.4% decrease in employment. The causes of this decline are unknown. Visitation at Loon Mountain has remained relative constant for this time period (Kelley 2013), so the decline is unlikely to be related to Loon Mountain. General economic difficulties are more likely the cause and are likely exacerbated in Lincoln because of its tourist based economy. While jobs have decreased in Lincoln, wages have increased at the town, but not to the extent that they have at county and the state levels during this time period. This again may be related to the service industry that supports Lincoln’s tourism base.

**Table 3.9-3. Employment and Wage Data**

	Employment 2000	Employment 2012	% Change in Employment from 2000	Average Annual Wage 2000 (\$)	Average Annual Wage 2012 (\$)	% Change in Average Annual Wage from 2000
New Hampshire	605,931	612,432	1.1%	34,725.08	48,273.16	39.0%
Grafton County	49,155	52,026	5.8%	30,479.28	49,449.40	62.2%
Lincoln	1,970	1,842	-6.4%	19,820.32	25,398.88	28.1%

Source: NHELM I 2012

The quarterly unemployment data for 2012 shown in Table 3.9-4 indicate that the lowest rate of unemployment for the Town of Lincoln is experienced during the winter operating season of the resort. Lower unemployment rates also occur during the summer months. This likely is a result of increases in summer recreational activities bringing more tourists into the area, thereby creating the need for more tourism jobs. The highest rate of unemployment in the Town of Lincoln is during the spring, following the end of the ski season and prior to the start of the summer travel and tourism season. Grafton County as a whole was much less affected by the seasonal nature of employment in this region in 2012. Given both the winter and summer recreational opportunities provide by Loon Mountain, the data below suggests that the resort has a significant influence on the unemployment rates in the Town of Lincoln during both the winter and summer months.

**Table 3.9-4. Quarterly Unemployment Rates for 2012**

	Annual	January	April	July	October
New Hampshire	5.5%	5.9%	5.2%	5.7%	5.3%
Grafton County	4.4%	4.4%	4.2%	4.7%	4.1%
Town of Lincoln	5.8%	5.1%	8.0%	4.1%	5.0%

Source: Economic and Labor Market Information Bureau, NH Employment Security

**\*Benchmark Estimates for NH and Grafton County are awaiting final review by the Bureau of Labor Statistics, Washington, D.C., and are subject to change.**

Table 3.9-5 shows estimates of Loon Mountain’s direct and indirect effects on employment in the region. During the 2012-2013 ski season, Loon employed 72 people year-round. Another 285 people worked seasonal full-time positions and 475 people work seasonal part-time positions for a total of 832 seasonal and year-round staff. A cumulative economic, growth and fiscal impact analysis for Gore Mountain Interconnect and related projects in Johnsbury, New York completed for Gore Mountain Ski Center found that for every job supported by direct expenditures in the Study Area, an additional 0.15 to 0.25 job is created by secondary impact. These results were an estimation of the current combined economic and employment impact of all of New York Olympic Regional Development Authority’s (ORDA) facilities and events for the 2004-2005 fiscal year. (Kennedy 2007)

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Assuming the similar metrics apply to Loon Mountain and translating the seasonal full-time and seasonal part-time jobs into a full-time equivalent, it is estimated that the resort’s total direct and indirect effect on employment in the area equates to jobs including full-time, seasonal, and part-time work, or approximately 962 full-time equivalent jobs.

**Table 3.9-5. Regional Employment Derived From Loon Mountain Ski Resort, 2012-13**

Employment at Loon Mountain	Actual Employment	Full-time Equivalent
Year-Round Full-time	72	72
Seasonal Full-time*	285	143
Seasonal Part-time*	475	119
Total	832	334
Indirect Employment (job x 0.15-0.25)	125-208	50-84
Total Loon Mountain and Indirect	957-1040	384-418

\*Data provided by Loon Mountain Ski Resort

***Direct and Indirect Effects***

Direct and indirect socioeconomic effects to the project area and Grafton County are expected to occur under both alternatives. Direct effects include changes in sales such as direct payment for goods and services, jobs, and income in connection with the project to local businesses benefiting from visitor spending.

Indirect effects are changes in sales, jobs, and income that result from expenditures by project suppliers for machinery, services and materials such as piping, pumps. These effects generally would occur in the wholesale and retail trade and personal services sectors of the economy by households affected by the project. These effects are changes in economic activity due to household spending from income earned from direct or indirect visitor spending. The socioeconomic effects from indirect spending are often referred to as “ripple” or “multiplier” effects, as increased employment income is spread through the economy.

Table 3.9-6 provides a summary of estimated qualitative socioeconomic effects to the communities around the Town of Lincoln. Effects are shown for both the term (one to ten years) and long-term (ten to forty years). Long-term values shown represent potential socioeconomic effects in comparison to existing or

short-term conditions. Actual effects may vary from projections due to a variety of factors including weather conditions, changes within the marketplace and the timing of the implementation of the project.

**Table 3.9-6. Summary of Estimated Socioeconomic Effects to Grafton County and Local Communities**

	Alternative A		Alternative B	
	Short-Term	Long-Term	Short-Term	Long-Term
Expected Skier Visits	No change	Potential decline due to continued reduced skier experience for learners	Variable, but average annual visitation could increase slightly	Variable, but likely stable trend after initial slight increase
Population Grafton County	Slight increase	Variable	Slight increase	Variable
Housing Grafton County	Slight increase	Variable	Slight increase	Variable
Ski Related Employment & Wages	No Change	Possible slight decline	Slight increase in employment	Stable at slightly higher levels
Ski Area Operation Direct Effects	No Change	Variable, depending on visitation changes	Minor increase to local economy due to potential increase in skier visitation	Stable at slightly increased levels due to increased operational expenditures
Ski Area Operation Indirect Effects	No Change	Variable, depending on visitation changes	Potential minor increase to local economy	Stable at slightly increased levels in local/regional economies

**Note:** Estimated effects are the result of no action or implementation of the Proposed Action.

**Alternative A – No Action**

Alternative A represents no significant change in the socioeconomic character of the Town of Lincoln or of Grafton County. There would be no new expenditures or temporary jobs from construction of the Proposed Action.

In the long term (ten to forty years), population and housing in Grafton County would vary with economic conditions. Skier visits and revenue totals are also likely to be variable, fluctuating primarily with timing and location of natural snowfall and varying economic factors. Unsatisfactory guest experiences for

learners would be expected to result in a slight decline in visitation at Loon Mountain as learning skiers seek less crowded terrain elsewhere.

Potential long-term socioeconomic effects under this alternative include minor reductions in indirect income and seasonal and year-round employment.

### Alternative B – Proposed Action

Alternative B would result in both direct and indirect effects to the socioeconomic character of the analysis area. Short-term expenditures by project suppliers and subcontractors would boost the local economy and there would be an increase in temporary employment from project construction. The short-term effects of Alternative B on population, housing, stress on community services would be expected to be minimal in the immediate area, as little new permanent full-time employment would be expected to be created.

Long-term employment effects are most likely to be experienced by those who rely upon Loon Mountain for winter employment, as slightly increased resort visitation would likely lead to greater job stability. Several new part-time seasonal jobs would likely also be created. Improved visitation would also contribute to greater indirect employment stability in the service sectors of the surrounding communities. The long-term viability of the ski area would be improved as the resort would more reliably meet user expectation

### Cumulative Effects

The socioeconomic resources cumulative effects analysis area includes the Town of Lincoln and the greater Grafton County, as these are the areas within which virtually all of the socioeconomic effect of the Proposed Action would occur. Issues relate to economic vitality of the communities while still preserving the New England village way of life. The time frame covers 10 years before and 40 years after implementation of the project actions, consistent with the term of Loon Mountain's SUP. Cumulative effects are considered to be both positive and negative.

Actions in the recent past and present have resulted in gains in population, housing and wages in the Town of Lincoln, but growth in employment and wages (in both Grafton County and the State of New Hampshire has

considerably exceeded that of Lincoln's. However, population increases in Lincoln have exceeded those of Grafton County (and the State of NH) which may suggest that Lincoln's population growth is comprised of retirees that are not part of the labor force.

In the foreseeable future, it is expected that Alternative A would not add cumulatively to trends, either positive or negative, in population or employment in the Town of Lincoln. In the longer term (six to forty years), economic recovery combined with continued modest growth in housing and wages would likely stabilize and then provide modest growth in population and employment. These trends would be largely unrelated to Loon Mountain and would have no significant effect on the socioeconomic resources of Grafton County.

Under Alternative B, the Proposed Action would add cumulatively but slightly to both the short and long-term to socioeconomic conditions in the Town of Lincoln. Alternative B would have minor positive but arguably negligible socioeconomic effects to Grafton County.

### **3.10 Traffic**

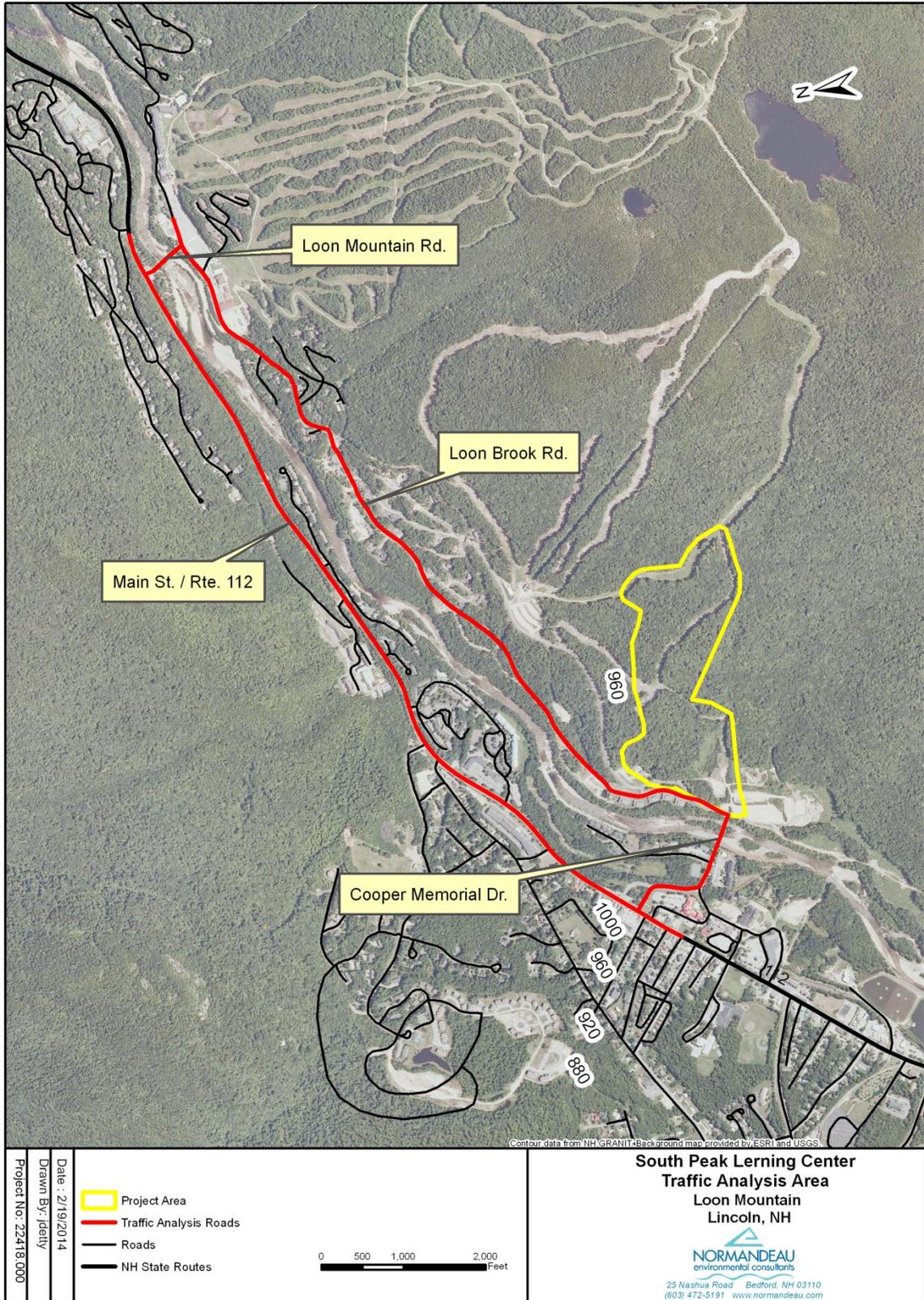
While the Learning Center expansion is not expected to significantly increase traffic into the Town of Lincoln, from either west or east, it would result in changes to traffic patterns around the project area.

Implementation of the proposed project will result in changes to the traffic patterns to and from the Loon Mountain base area and the South Peak area, along Route 112 and along the privately owned Loon Brook Road. There is concern that the Learning Center may cause an increase in traffic along Loon Brook Road in the area of the Westwood Homeowners Association (WHA).

#### *Direct and Indirect Effects Analysis*

The direct and indirect traffic effects analysis area includes Main Street (Rte. 112) in the Town of Lincoln, Cooper Memorial Drive which provides access from Main Street to the existing South Peak parking area and the South Peak Resort area, the entrance to the main resort area along Loon Mountain Road and

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**Figure 3.10-1 Selected Lincoln Roadways Assessed for Potential Traffic Impacts**

the private Loon Brook Road that provides a limited-access connection between the main resort area and the South Peak overflow parking area and Cooper Memorial Drive. The direct and indirect effects are described for a period of 10 years from project implementation, which is assumed to be consistent with the available traffic studies' projections for full build-out of the South Mountain Resort development.

*Existing Conditions*

Traffic conditions were evaluated for the 2002 Loon Mountain EIS (Pernaw 1998, 2000a, 2000b). These studies evaluated expected traffic conditions resulting from the now implemented South Peak ski terrain expansion, as presented in Alternative B of the EIS and the associated ROD. Traffic conditions were again evaluated as part of the South Mountain Resort development (Pernaw 2005, 2006). This development has been only partially implemented, but existing and predicted future traffic conditions are believed to be largely consistent with these traffic studies. This Learning Center EA utilizes those studies to anticipate the changes in traffic that are anticipated to result from the proposed action.

As mentioned in Chapter 1, scoping comments identified a concern that the Proposed Action would result in an increase in traffic along Loon Brook Road in the nearby Westwood Acres area, a residential area adjacent to the permit area.

Loon Mountain and the Westwood Homeowners Association jointly signed a Memorandum of Understanding (MOU) in September of 2004 regarding traffic management through the Westwood Acres area. According to the MOU, Loon's responsibilities during peak winter season and major summer events, include a duty to "maintain a security person and/or install a gate and/or an access card system ....in an attempt to limit vehicular access upon Loon Brook Road only to the Permitted Vehicles." "Permitted Vehicles" in this agreement are defined as those operated by members of the Westwood Homeowners Association and their guests, Loon Mountain vehicles, including shuttle buses and maintenance vehicles, governmental vehicles and service, delivery and emergency vehicles. Loon is also responsible for maintaining appropriate signage indicating that passage through Westwood Acres is allowed only for those "Permitted Vehicles" as defined above.

Additionally, there is a gate on Loon Brook Road between the South Mountain vacation home development and the Westwood Acres development; the gate is owned and operated by the South Peak Homeowners, their guests, Loon Mountain administrative vehicles, shuttle buses and certain governmental entities and emergency vehicles. This effectively eliminates Loon Brook Road as a public through route between the South Mountain base area and the main Loon Mountain base area for unauthorized vehicles. In addition, Loon Mountain maintains traffic control personnel at the west end of main base area to re-direct unauthorized traffic from the Loon Brook Road.

*Direct and Indirect Effects*

*Alternative A: No Action*

Under the No Action Alternative, traffic volume and patterns will remain unchanged. Traffic entering the resort via Cooper Memorial Drive would continue at current levels commensurate with the existing development of the South Mountain Resort and skier use of the existing South Peak Lincoln Express Quad and the South Peak parking area. Shuttle buses would continue to transport skiers and boarders between the South Peak parking area and the main resort via the private and gated Loon Brook Road, which passes through Westwood Acres.

Traffic control personnel would continue to direct unauthorized through-traffic away from the Loon Brook Road during weekend and holiday periods and the traffic control gate located on Loon Brook Road west of Westwood Acres would remain in place. (See Figure 3.10-1)

*Alternative B: Proposed Action*

The South Peak Learning Center project would provide a second full service portal to the resort, including parking, lodge services, and ski trail access to the main mountain. This additional portal would not change vehicle traffic volumes, but would change the routes of travel to and from the two parking and base areas.

Main Street/Route 112:

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The Learning Center portal will reduce traffic on Main Street/Route 112 between Cooper Memorial Drive and Loon Mountain Road (Figure 3.10-1) on most ski days because skiers will be able to use Cooper Memorial Drive to access South Mountain and, from there, have full lodge services as well as ski trail access to the main resort base area.

### Loon Brook Road:

Because of improved lodge services and access provided by the Learning Center, the demand for shuttle services to bring skiers between the main base area and the South Peak parking area via the Loon Brook Road and through Westwood Acres would be reduced. Visitors would be able to park at the South Peak parking area and access the entire resort via ski trail rather than shuttling between South Peak and the base area.

Traffic control personnel would continue to direct unauthorized through-traffic away from the Loon Brook Road during weekend and holiday periods and the traffic control gate located on Loon Brook Road west of Westwood Acres would remain in place. (See Figure 3.10-1)

### Loon Mountain Road:

Traffic on Loon Mountain Road will be reduced because visitors wishing to access the South Peak area will be able to access that area directly via Cooper Memorial Drive for parking and lodge services at the Learning Center.

### Cooper Memorial Drive:

Visitors who previously parked at the main base area and took shuttle buses to and from the South Peak area along Loon Brook Road will now be able to park at South Peak and access the rest of the resort via ski trail. This will result in an increase in traffic along Cooper Memorial Drive, and a reduction in traffic along Route 112 and along Loon Brook Road.

The Learning Center Project is not expected to increase peak skier use levels. The South Peak parking areas that are adjacent to the proposed project are already used extensively during peak ski days and this level of use would not be expected to increase as a result of the proposed action. The new terrain at the Learning Center does not significantly increase “comfortable carrying capacity”

(CCC) at the resort and would therefore not be expected to generate significantly increased traffic. Furthermore, parking capacity would remain at existing levels, effectively restricting the amount of traffic that the resort can experience. Loon Mountain personnel already monitor parking lot status and when lots are full, no further traffic is allowed into the parking areas.

While it is difficult to determine precisely how traffic patterns would change with implementation of the proposed action, it is anticipated that through-traffic on the privately owned Loon Brook Road would likely decrease as a result of the Proposed Action.

The majority of construction traffic associated with the development of the Learning Center would access the project from Route 112 and via the Cooper Memorial Bridge. Administrative traffic during the construction period may increase traffic temporarily along the Loon Brook Road through the Westwood Acres and South Mountain residential areas. This administrative traffic is allowed under the terms of the MOU and is anticipated to increase only during the construction phases of the project.

### *Cumulative Effects*

Available traffic studies for the Loon Mountain/Town of Lincoln area have evaluated expected traffic conditions based on past, present and reasonably foreseeable activities in the area. Because of the recent downturn in the economy, build-out of planned developments (South Mountain Resort, Forest Ridge) has not proceeded as expected; thus it is believed the traffic projections in those studies are accurate for at least the next 10 years. Because the South Peak Learning Center would neither significantly increase traffic in the Town of Lincoln nor increase traffic access to the South Peak area via Cooper Memorial Drive beyond current peak levels, this proposed project would not cumulatively add to past, present or reasonably foreseeable traffic conditions within the analysis timeframe.

## 4 Consultation or Coordination

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The Forest Service consulted the following individuals, Federal, State, and local agencies, and members of the public during the development of this environmental assessment:

### 4.1 USDA Forest Service Participation

The following WMNF employees participated in initial scoping, were members of the Interdisciplinary Team, provided materials for incorporation into the EA, and/or provided technical review of the EA.

Name	Title
Tom Wagner	Forest Supervisor
Susan Mathison	Eastern Region Winter Sports Team Leader
Joe Gill	Eastern Region Winter Sports Team – Project Lead
Stacy Lemieux	Forest Planner
Clara Weloth	Fisheries and Wildlife Biologist
Ken Allen	Landscape Architect
Erica Roberts	Ecologist
Sheela Johnson	Forest Hydrologist
Robert Colter	Forest Soil Scientist
Sarah Jordan	Forest Archaeologist

### 4.2 Other Governmental Agencies Contacted

The following were contacted during the environmental analysis process and provided materials or information that was incorporated into the EA.

- New Hampshire Division of Historic Resources
- US Fish and Wildlife Service

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## 6 Abbreviations and Acronyms

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AMC	Appalachian Mountain Club
AT	Appalachian Trail
BE	Biological Evaluation
BMPs	Best Management Practices
BSB	Bear-scarred Beech
CCC	Comfortable Carrying Capacity
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
DC	Desired Condition
DWA	Deer Wintering Area
EA	Environmental Assessment
EIS	Environmental Impact Statement
ELT	Ecological Land Types
EPSC	Erosion Prevention and Sediment Control
ESA	Endangered Species Act
FEIS	Final Environmental Impact Statement
FMF	February Median Flow
Forest Plan	White Mountain National Forest Land and Resource Management Plan
Forest Service	USDA-United States Forest Service
FSH	Forest Service Handbook
FSM	Forest Service Manual
ft	feet
gpm	gallons per minute
HUC	Hydrologic Unit Code for USGS
ID Team	Interdisciplinary Team
LLC	Limited Liability Company
LOC	Likelihood of Occurrence
Loon Mountain	Loon Mountain Ski Resort
LMW	Loon Mountain Wetland
MA	Management Area

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MDP	Master Development Plan
Mgal	Million Gallons
MIS	Management Indicator Species
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
NFS	National Forest System
NH	New Hampshire
NHDES	New Hampshire Department of Environmental Services
NHDHR	New Hampshire Division of Historic Resources
NHEMLI	New Hampshire Employment and Labor Market Information
NHFG	New Hampshire Fish and Game Department
NHOEP	New Hampshire Office of Energy and Planning
NMFS	National Marine Fisheries Service
NNIS	Non-native Invasive Species
NRCS	Natural Resource Conservation Service
NSAA	National Ski Area Association
PEM	Palustrine Emergent Wet Meadow
pH	A Measure of the hydrogen ion concentration of a solution. Negative logarithm to the base 10 of the hydrogen ion concentration.
R9	Eastern Region Forest Service
RFSS	Regional Forester Sensitive Species
ROD	Record of Decision
RSA	Revised Statutes Annotated (New Hampshire)
S&Gs	Standards and Guidelines
SIO	Scenic Integrity Objective
SMS	Scenery Management Systems
sq	square
SOPA	Schedule of Proposed Actions
SUP	Special Use Permit
TDD	Telecommunication Device for the Deaf
TEPS	Threatened, Endangered, and Proposed Species
TMDL	Total Maximum Daily Load
TTY	Text Telephone

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USACOE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USDI	United States Department of Interior
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geologic Survey
WMNF	White Mountain National Forest
WNS	White-nose Syndrome