

# White Mountain National Forest



United States  
Department of  
Agriculture

Forest  
Service

**Eastern  
Region**

July  
2004



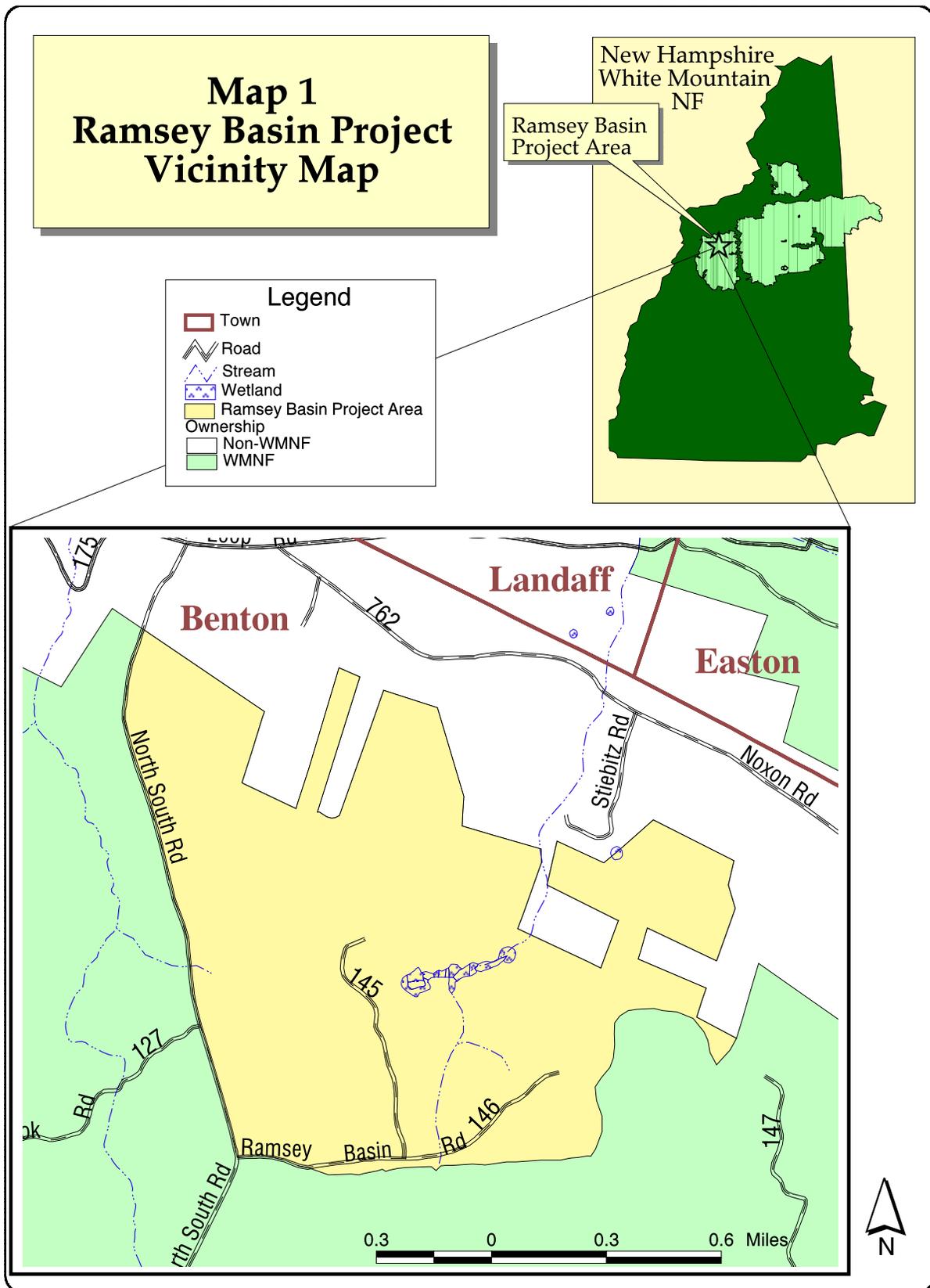
## Ramsey Basin Project

White Mountain National Forest  
Grafton County, NH

## Environmental Assessment



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Cover Photo: View from the North South Road of an old log landing/wildlife opening in the Ramsey Basin Project Area. Stand 4 begins approximately 100 feet past the trees seen on the far side of the opening. In 1988, there was a shelterwood harvest in stand 4, and an overstory removal is planned for this stand in the Ramsey Basin Project.

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Photo 1: View from the North South road looking west across to Long Pond.

# Map 2 Ramsey Basin Project Management Areas

**Management Area**

- 2.1
- 3.1
- 6.1

**Town**

- Landaff
- Benton
- Easton

**Stream**

**Road**

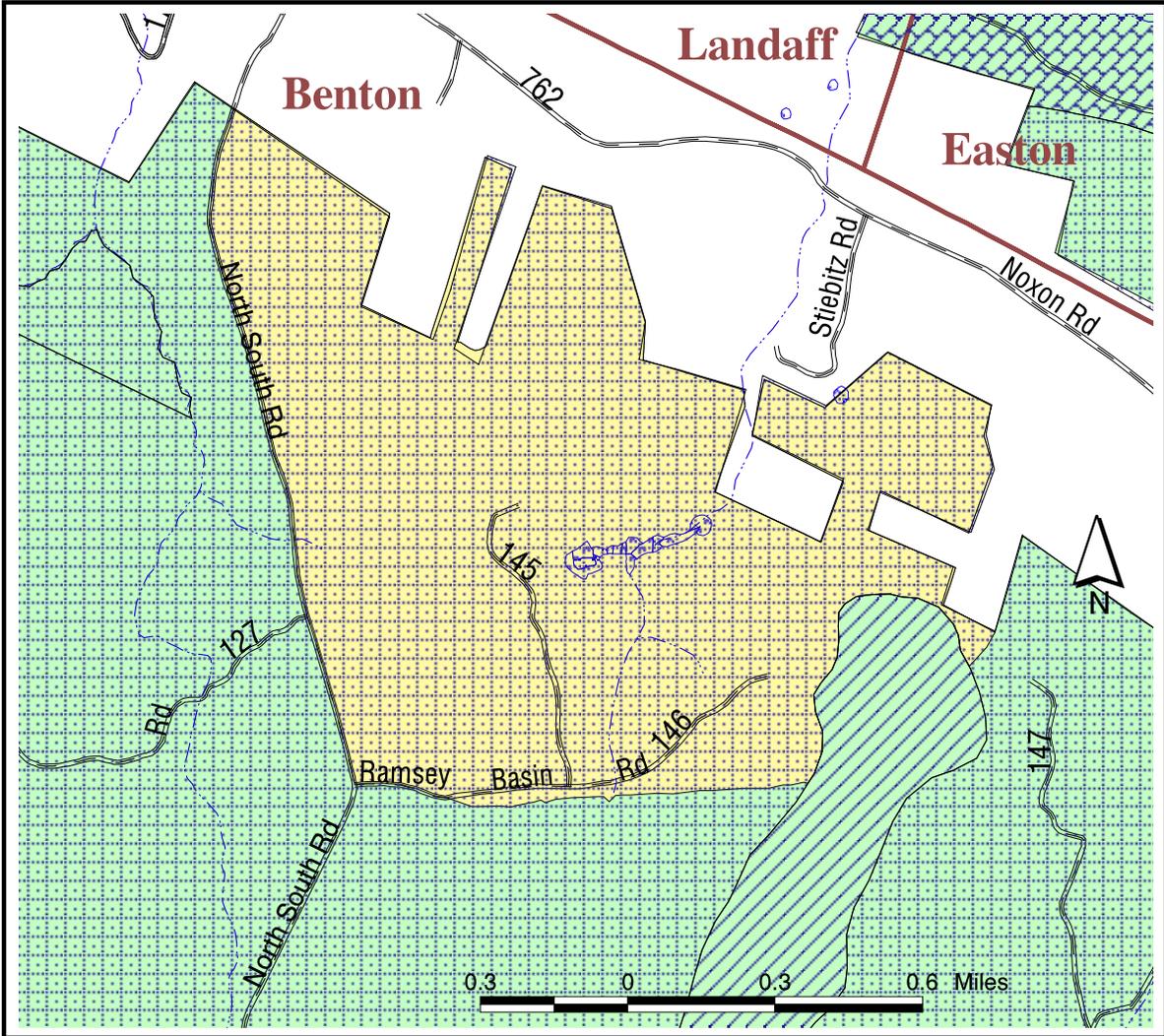
- North South Rd
- Stiebitz Rd
- Noxon Rd
- Rd 145
- Rd 146
- Rd 147

**Wetland**

**Ramsey Basin Project Area**

**Ownership**

- Non-WMNF
- WMNF



# Chapter 1- Purpose & Need

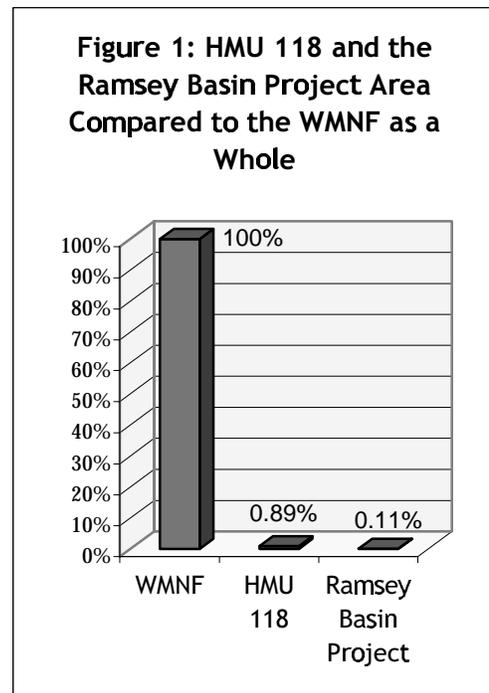
## Introduction

The site-specific needs for the Ramsey Basin Project Area, the activities and alternatives proposed to implement management direction as outlined in the White Mountain National Forest Land and Resource Management Plan (Forest Plan), as amended (USDA, 1986a), and the potential resource effects resulting from those activities have been considered in the preparation of this environmental assessment (EA). This Ramsey Basin EA is tiered (40CFR1508.28) to the White Mountain National Forest Land and Resource Management Plan Final Environmental Impact Statement and Record of Decision, as amended (USDA, 1986) (Forest Plan).

## Location

The Ramsey Basin Project Area is located in the Town of Benton, New Hampshire, Grafton County on the Ammonoosuc/Pemigewasset Ranger District of the White Mountain National Forest (Map 1, p. 2).

The Ramsey Basin Project Area is approximately 800 acres of federal land within Management Area (MA) 3.1 (Map 2, p.4) within HMU 118 (Map 3, p. 6). The Project Area is managed using both even-aged (55%) and uneven-aged (45%) silvicultural systems. The Ramsey Basin Project Area represents approximately 0.1% of the White Mountain National Forest (Figure 1)<sup>1</sup>.



## Proposal

The Ammonoosuc/Pemigewasset Ranger District is considering the implementation of Alternative 3 (Modified Proposed Action, Map 5, p. 14) to meet the needs of increasing early-successional habitat and the softwood component in Habitat Management Unit 118 and to supply a sustainable flow of forest products. See Alternative 2 (p. 13) for the Proposed Action that was Scoped (Map 4, p. 13, Table 2, p. 16).

# Map 3 Ramsey Basin Habitat Management Units

## Legend

-  Town
-  Road
-  Stream
-  Wetland
- HMU 118 Compartments
  -  Comp. 44 Ramsey Basin Project
  -  Comp. 45
  -  Comp. 46
  -  Comp. 47
- Ownership
  -  Non-White Mountain NF
  -  White Mountain NF

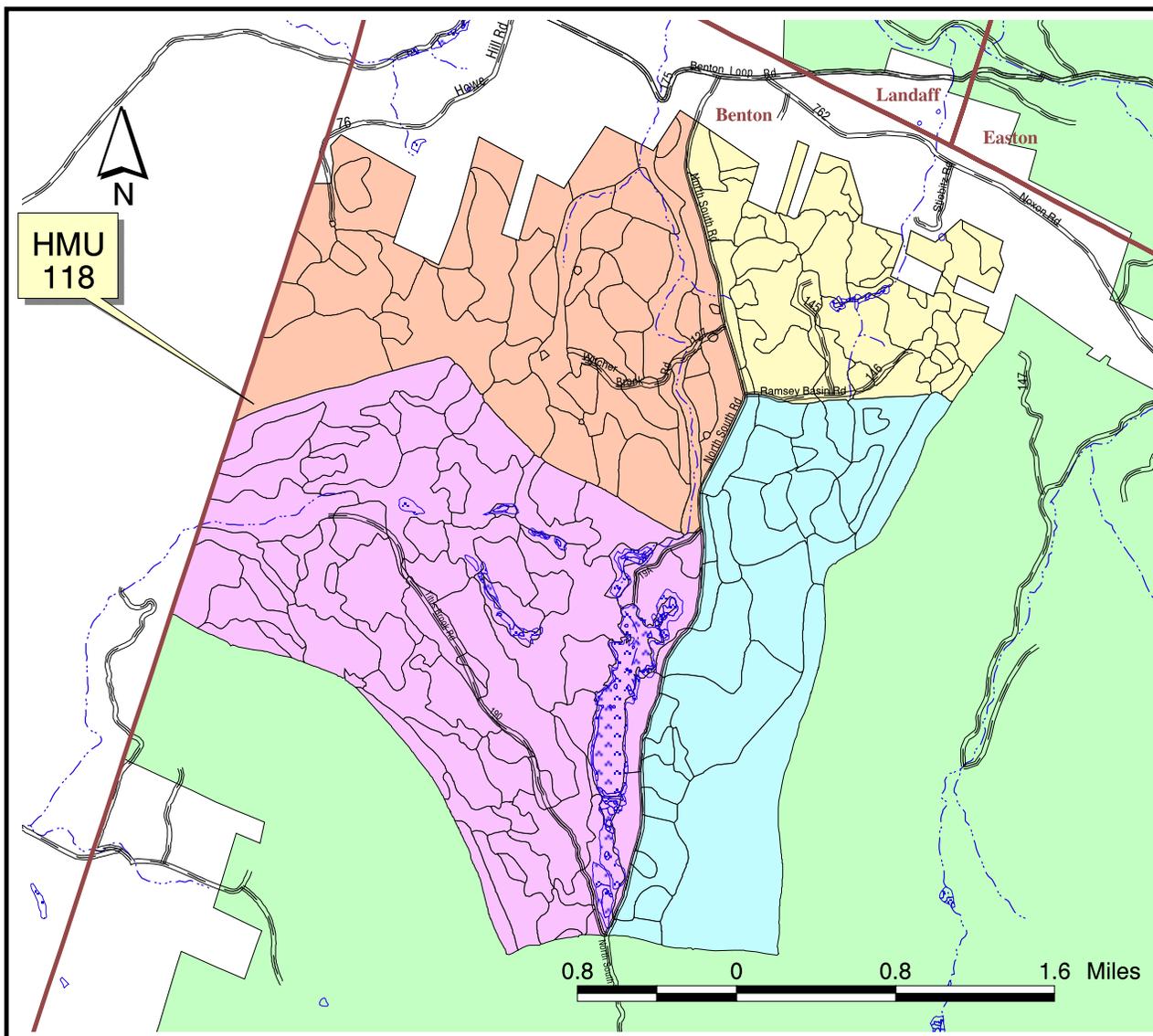


Table 1 displays the actions proposed by the Forest Service that are compatible with standards and guidelines for silvicultural treatments and meet the needs for change identified for the Ramsey Basin Project Area. See Endnotes for a list of applicable mitigation measures<sup>2</sup> stand treatment acres, individual treatments, and season of harvest<sup>3</sup>.

**Table 1: Activities in Modified Proposed Action**

Activity	Amount	
Timber Harvesting:	Treatment Ac	Stand Ac
<b>Even-Aged Management -</b>		
Clearcutting (northern hardwood, mixed hardwood softwood)	40 Ac	44 Ac
Overstory Removal (spruce/fir)	23 Ac	
<b>Uneven-Aged Management -</b>		
Single-Tree Selection (approximately 25% of the stand basal area)	88 Ac	94 Ac
Group Selection (groups range in size from 1/10 to 2 Ac in size; 1/2 Ac average; represent approximately 20% of stand Ac)	28 Ac	137 Ac
<b>Total</b>	<b>179 Ac</b>	<b>298 Ac</b>
<b>Transportation:</b>		
Road Maintenance (North South Road FR19, FR 145, 146)	1.6 Mi	
<b>Approximate Volume:</b>	<b>1.4 MMBF</b>	

## Background

Vegetation management last occurred in Compartment 44 in the mid to late 1980s. Individual stand stocking levels have increased following the most recent harvest activities. Surveys conducted in Compartment 44 determined that some stands have reached maturity, competition between individual trees has slowed growth, crowded trees are stressed, which could cause mortality, and the regenerating age class has grown into the young age class.

## Past and future activities relevant to the Ramsey Basin Project

The most recent vegetation management in the Ramsey Basin Project Area was the Davis Brook Timber Sale Project (1984).

Part of the analysis process included looking at the effects of past, present, and reasonably foreseeable future projects in conjunction with the proposed activities. To assess those effects, actions that have occurred or might occur in a wider area that encompasses the Project Area are considered. For some cumulative effects analyses of the Ramsey Basin Project, the landscape area is HMU 118.

The Titus Brook II Timber Sale (west of the Project Area) was completed in the winter of 2003-4. The Howe Hill Timber Sale (southwest of the Project Area) was completed in 1997. The Boutin Corner Timber Sale is located north and east of the Project Area, but is separated by approximately 1/2 mile of private land and is located in HMU 117. Harvesting was completed in the winter 2004.

A project with activities similar to those in the Titus Brook II and the Howe Hill projects and proposed in Ramsey Basin is expected to be implemented in Compartment 45 within three years. There is also an additional project (Stark Falls) planned within the Town of Benton in the next several years, but it is not within HMU 118.

## **Purpose & Need**

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The Purpose of the Ramsey Basin Project is to implement White Mountain National Forest Plan direction in the Project Area. This can be accomplished by addressing the need for site-specific activities that will move the Project Area toward the desired condition in the Forest Plan.

Management Area 3.1 is an MA on the White Mountain National Forest where the goals include increasing wildlife habitat diversity and providing large volumes of high-quality sawtimber and other forest products on a sustained yield basis (Forest Plan, p. III-36)<sup>4</sup>. To accomplish these goals, vegetation management may be practiced with even-aged or uneven-aged silvicultural methods. In MA 3.1 even-aged management predominates, because it is the most efficient method of reaching the goals listed above.

The uneven-aged system may be used in MA 3.1 areas where soils are wet, where existing vegetation is shade tolerant and best suited to the site, or where other resource values conflict. Concern for visual quality is often one of the factors. Uneven-aged management favors the development of shade-tolerant species (sugar maple, American beech, and hemlock), which grow slowly and provides less habitat diversity than even-aged management. Management techniques include group and single-tree selection and a combination of the two. Of uneven-aged techniques, group selection provides the most species and habitat diversity. Seedling species that are medium to shade-intolerant can survive where the sunlight is the most intense in the openings created by the group harvests. Single-tree selection provides the least species diversity.

## **Site-specific needs identified for the Ramsey Basin Project Area**

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### **1. Maintaining and increasing the diversity of wildlife habits -**

#### *Early-successional habitat*

A Forest Plan goal for MA 3.1 is to provide an array of habitats for wildlife, especially early-successional habitat (regenerating, 0-9 years) (Forest Plan, p. III-36). This dense growth of woody and herbaceous vegetation is used by a wide variety of wildlife species for at least part of their life cycle.

At the landscape level (HMU 118), the lands where vegetation management is practiced provide 5.1% early-successional habitat.<sup>5</sup> Ideally, there should be 10% of the area in early-successional habitat (Forest Plan, p. III-13, VII-B-4, & VII-B-5;). Over the coming decade, as trees age, early-successional habitat will decline to 0%.

*Based on Forest Plan desired composition (10% 0-9 years), there is a need for increased early-successional habitat at the landscape level.*

#### *Lack of spruce/fir community type -*

The Forest Plan envisions a variety of habitat types in HMUs (Forest Plan, p. III-36). At the landscape level (HMU 118), there is a lack of the spruce/fir habitat community especially on lands managed using both even- and uneven-aged silvicultural systems<sup>6</sup>. There is also an over abundance of the northern hardwood community type.

*Based on Forest Plan desired compositions, there is a need for increased spruce/fir community type on MA 3.1 lands in HMU 118 on the even-aged lands.*

## 2. Maintaining a sustainable flow of forest products -

A Forest Plan goal for MA 3.1 is to provide high-quality sawtimber, fiber, and other forest products on a sustained yield basis (FP, p. III-36).

Demand for forest products on the Ammonoosuc-Pemigewasset Ranger District of the White Mountain National Forest has been high. In FY'03, the District sold 10 million board feet of forest products for a total of 2.1 million dollars, in five (5) timber sales. There were up to ten (10) bidders on the various sales. The products included high-quality sawtimber and round wood.

To maintain a sustainable, efficient, and even flow of forest products, stands need to be treated periodically. In compartment 44, some stands are mature and ready for harvest. They can be regenerated and ready for harvest again in 80 to 120 years. Other stands have stocking or soil conditions adaptable to uneven-aged management. These can receive a partial harvest, and the space created will be available to young replacement trees. In some stands, this can be done so that softwood trees will become a greater part of the future stocking.

Sawtimber and fiber produced through timber harvesting would provide the forest products envisioned in the Forest Plan.

*Based on Forest Plan goals and existing stand conditions in compartment 44, there is a need for silvicultural treatments to provide a sustainable flow of forest products, a diversity of habitats, and greater percentage of softwood stocking.*

## Decisions to be made

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The Ramsey Basin Project EA evaluates site-specific issues, considers alternatives, and analyzes the effects of the activities considered in the Proposed Action and alternatives to that proposal. Based on the needs identified for the Ramsey Basin Project, the scope of the project is limited to decisions concerning sustainable vegetation and wildlife habitat management. The EA provides the deciding officer (Ammonoosuc/ Pemigewasset District Ranger) with the information necessary to make informed decisions with regard to the Ramsey Basin Vegetation Management Project and provides the basis for determining:

1. Which actions, if any, would be approved (which alternative to implement) that would move the Ramsey Basin Project Area towards the desired condition per Forest Plan direction and addresses the needs and issues identified for this project;
2. What mitigation measures and monitoring requirements will the Forest Service apply to the proposed activities;
3. Whether the proposed project has significant impacts that would trigger the need to prepare an Environmental Impact Statement; and
4. Whether a Forest Plan Amendment will be required to implement this project?

If an action alternative is selected, project implementation could begin in during the summer of 2004 and last for several years.

## Public involvement

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The Forest Service mailed a Scoping letter to approximately 270 interested parties on July 23, 1998.

The proposal was re-listed in the White Mountain National Forest Schedule of Proposed Actions (SOPA) beginning in December 2001 .

Three (3) individuals commented on the proposed action during the formal Scoping process. Comments were used to define significant (unresolved) issues, to develop alternatives, and to analyze effects.

In May, a 30-Day Comment Report was mailed to the three individuals who commented during Scoping on the Ramsey Basin Project Proposal or otherwise expressed interest in receiving the 30-Day Comment Report. The 30-Day Comment Period closed on June 28, 2004, and no responses were received during that time.

## Issues

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### Issues that were raised during Scoping for the Ramsey Basin Project

The Forest Service separated issues into two groups:

- Issues addressed or resolved elsewhere or at a higher level (non-significant)<sup>8</sup>; or
- Issues used to develop alternatives (unresolved/significant) (CEQ, §1501.7 & §1506.3).

Issues used to develop alternatives were defined as those directly or indirectly caused by implementing the proposed action.

The Forest Service identified the following two unresolved (significant) issues during Scoping:

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#### 1. Cumulative Effect of Even-Aged Management (Public)

The amount of clearcutting and overstory removal proposed in this project area will have negative effects on wildlife habitat and visual resources, especially when added to the clearcutting that has occurred on adjacent public and private land (cumulative impact).

The measures used to evaluate how the alternatives address this issue will be:

**Measurement 1a:** The average early-successional habitat on MA 3.1 lands in HMU 118 provided during this decade (through 2014) compared to the desired composition for an “ideal” HMU in the Forest Plan (10%; LRMP, p. III-13);

**Measurement 1b:** The amount clearcutting/overstory removals in a cumulative effects area consisting of HMU 118 and an additional 1/2-mile of private land to the north and west of HMU 118; and

**Measurement 1c:** The North South Road is the only viewpoint for the Ramsey Basin Project Area. The measurement would be temporary openings visible from the North South Road in HMU 118 provided through 2014.

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#### 2. Lack of Long-Term Softwood Component in HMU 118 (Agency)

The vegetative treatments in the Ramsey Basin Project Area will not increase the softwood component in HMU 118 that is currently below the Forest Plan desired condition.

The measures used to evaluate how the alternatives address the issue will be:

**Measurement 2a:** The predicted long-term change in hardwood and spruce/fir habitat community in HMU 118 compared to the existing and desired composition for an “ideal” HMU in the Forest Plan (LRMP, p. III-13).

**Measurement 2b:** The predicted long-term effect on wildlife from a change in hardwood and spruce/fir habitat community in HMU 118.

## Chapter 2 - Alternatives

### Introduction

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This chapter includes a description and comparison of alternatives considered for the Ramsey Basin Project. This section also presents the alternatives in comparative form, sharply defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public.

### Alternatives

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The interdisciplinary (ID) team considered seven alternatives for the Ramsey Basin Project, including the Proposed Action and No Action alternatives.

### Alternatives eliminated from detailed consideration

The following discussion explains the three alternatives that were eliminated from detailed consideration and why they are not being carried forward.

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#### A. Create more early-successional habitat to more closely meet Forest Plan desired conditions (agency)

The Ramsey Basin Project identified the need for creating early-successional habitat in HMU 118 to meet the Forest Plan desired composition of 10%. The Proposed Action would not achieve this amount of regeneration. The ID team looked for additional opportunities within the project to create more early-successional habitat.

The few paper birch or aspen stands in HMU 118 are currently in the regenerating or young age classes, and it will be decades before silvicultural treatment is needed to sustain these habitat communities.

The stands proposed for regeneration in this project are northern hardwoods that contain significant amounts of early-successional species (paper birch, aspen). These species mature earlier than northern hardwood species. Regenerating these stands now is silviculturally important to maintain this species component.

The majority of the remaining stands managed under the even-aged system is, on average, 70-90 years old and have few early-successional species components. Currently these stands do not meet silvicultural guidelines for maturity.

*No additional opportunities exist for creating early-successional habitat in the Ramsey Basin Project Area at this time, and this alternative was eliminated from detailed consideration.*

## **B. Mitigate logging operations for snowmobile use (agency)**

The North South Road is used for snowmobiling during the winter season.

A commentor wanted the Forest Service to provide joint use of the North South Road for snowmobiles and logging operations. Mitigation measures have been used on projects elsewhere on the district that restrict snowmobile use to weekends and holidays and logging operations to non-holiday weekdays.

The North South Road is not a heavily-used snowmobile corridor; most of the use is by nearby residents. Joint use would require that the road be plowed for hauling operations, and snowmobile use of the plowed road creates less than ideal conditions for log trucks.

This road has traditionally been closed during harvesting operations. Once hauling operations cease, the road would be reopened for snowmobiling. The Forest Service would notify snowmobile clubs when the road would be closed, and the Operator would have to provide signs indicating that the road was closed due to harvesting operations. *Therefore, this alternative was eliminated from detailed consideration.*

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## **C. Avoid using Forest Road 762 (Noxon Road) for hauling activities (public)**

The Proposed Action stated that access to Stands 14 and 46 would be via a right of way to Stiebitz Road to a point on Stiebitz Road approximately two tenths of a mile south of the junction with the Noxon Road. An alternative could be to remove harvested timber from these units to the south. This would require a skidding distance of over a half mile, up a slope of over 20%, and over a ridge down to Forest Road 146. Skidding uphill along this route would require restrictive hauling measures and would be more expensive than hauling downhill across the right of way to Stiebitz Road. The Forest Service has used this haul route in the past, and has invested time and money in the right of way to Stiebitz Road. .

In addition, Stiebitz and Noxon Roads are public roads on which the Town of Benton has no winter hauling restrictions.

Whether or not log hauling is restricted on the Noxon Road is a matter for the Town of Benton and is a matter that is beyond the jurisdiction of the Forest Service.

*For these reasons, this alternative was eliminated from detailed consideration.*

## **Alternatives considered in detail**

The following four alternatives are being considered for implementation in the Ramsey Basin Project Area.

If an action alternative is implemented, actual amounts of activities accomplished on the ground (measured in acres, MMBF, or miles) may differ slightly from current estimates. All variances would be evaluated to ensure that any effects are within the parameters of the effects analyzed in the Ramsey Basin EA and would be documented in the Ramsey Basin project file.

Management techniques, based on silvicultural science, can be used to change vegetation in a project area. The types of management activities proposed are dependent on the current conditions of forest types and other resource conditions such as soils and topography.

See Table 2, p. 16, for a summary comparison of the activities proposed for all alternatives. See Endnotes for a list of applicable mitigation measures<sup>2</sup> and stand and treatment acres, individual treatments, and season of harvest<sup>3</sup>.

### Alternative 1 - No Action

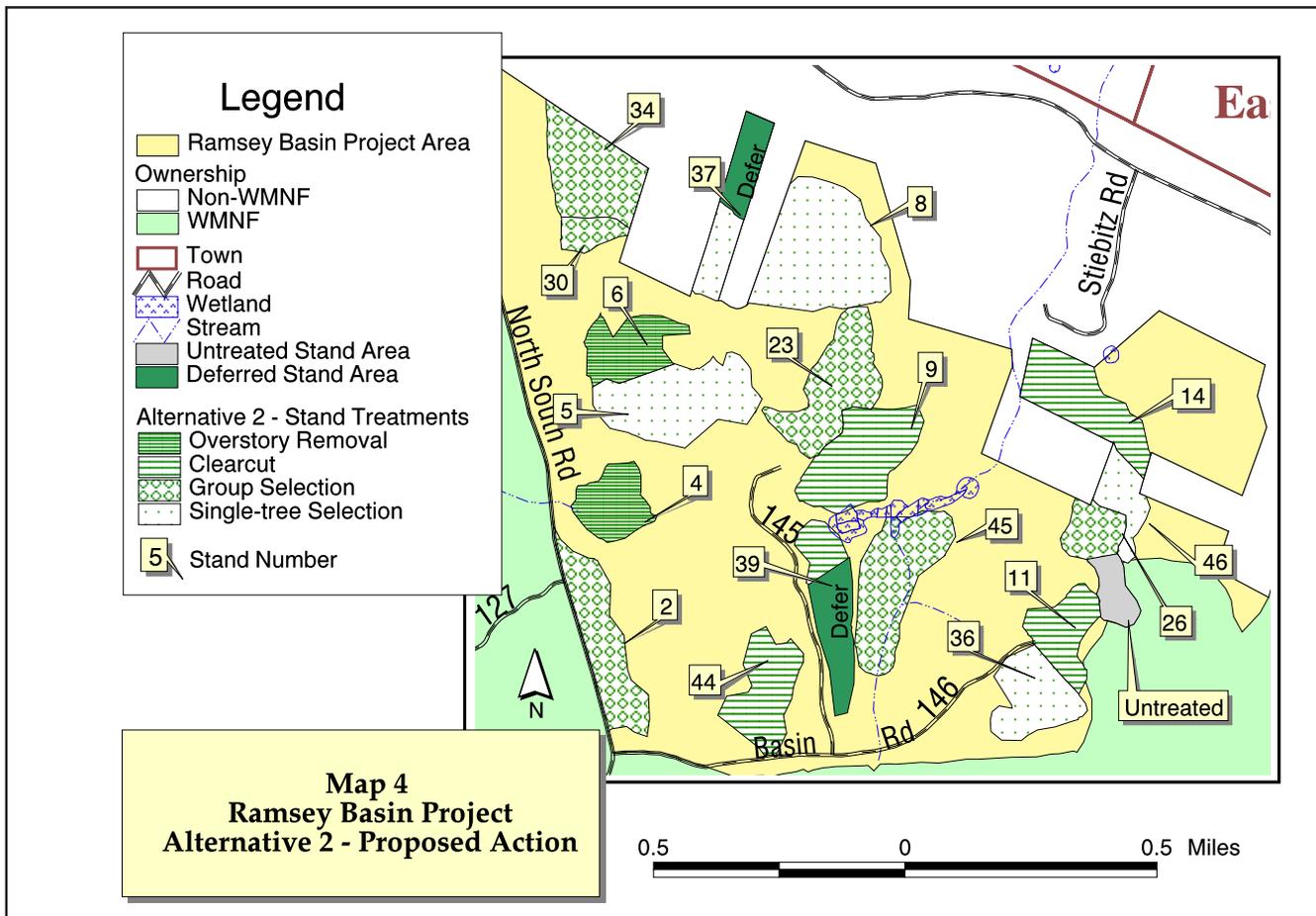
Under Alternative 1, current and on-going management activities would continue, but no new, Forest Service vegetation management activities would be initiated during this entry. Changes might occur through current management direction (such as road maintenance), natural processes, or other management decisions in the future. This alternative provides a foundation for describing and comparing the magnitude of environmental changes associated with the action alternatives against those changes that occur with no new federal action.

### Alternative 2 - Proposed Action

Alternative 2 is the Proposed Action that was Scoped during July 1998 (Map 4, below; Table 2, p. 16.

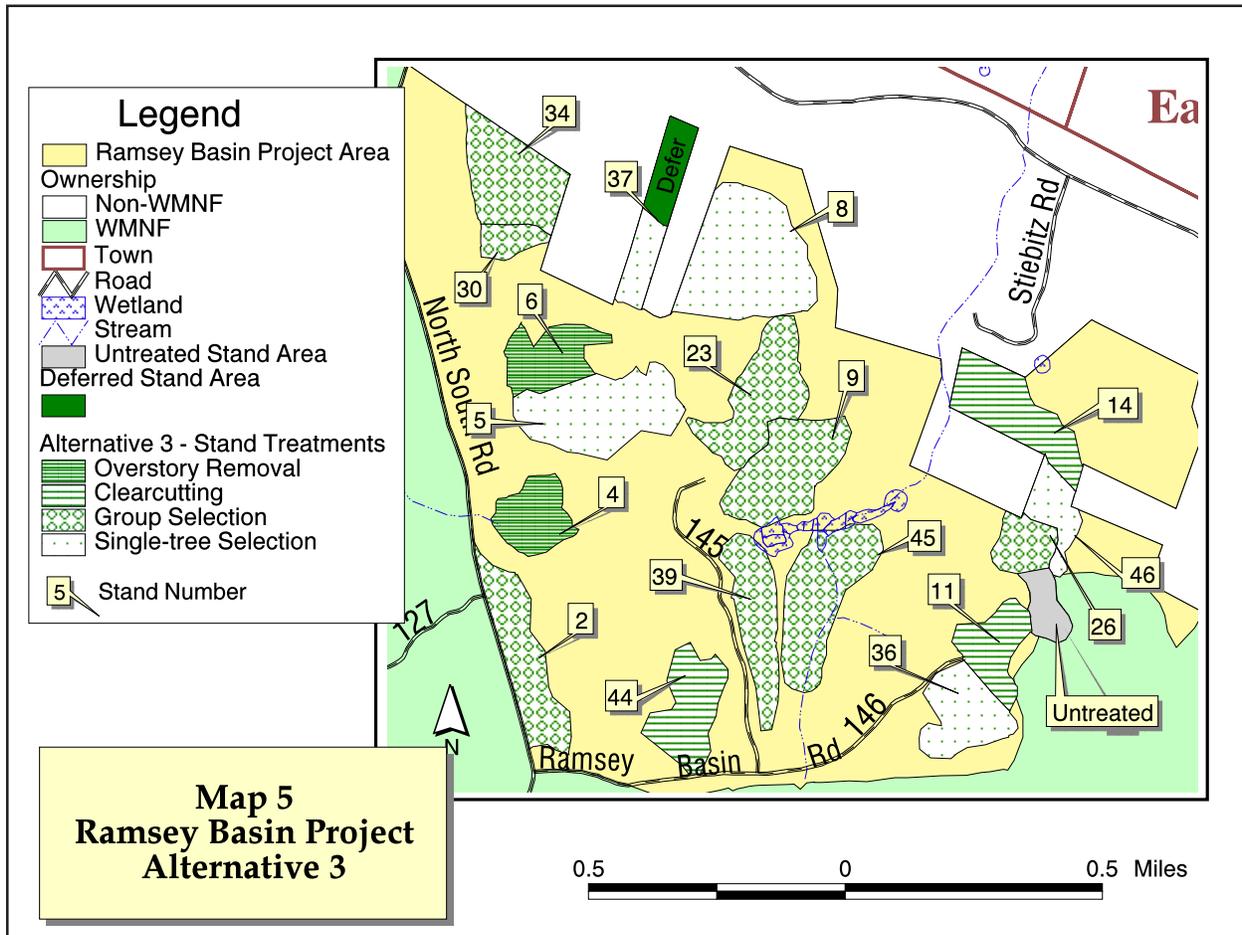
The Proposed Action is a collection of possible vegetative treatments that use acceptable silvicultural practices, follow Forest Plan standards and guidelines, and have a high probability of successfully achieving the desired condition for wildlife habitat and forest management sustainability.

Alternative 2 uses established silvicultural techniques to achieve the desired vegetative condition for wildlife habitat while giving equal importance to other resource values (visual and recreation).



### Alternative 3 - Modified Proposed Action

Alternative 3 (Map 5, below; Table 1, p. 7; Table 2, p. 16) responds to Issue 2 (p. 10). The clearcutting prescription in stands 9 and 39 have been changed in Alternative 3 to group selection and are intended to favor the long-term development of softwoods in these stands.



### Alternative 4

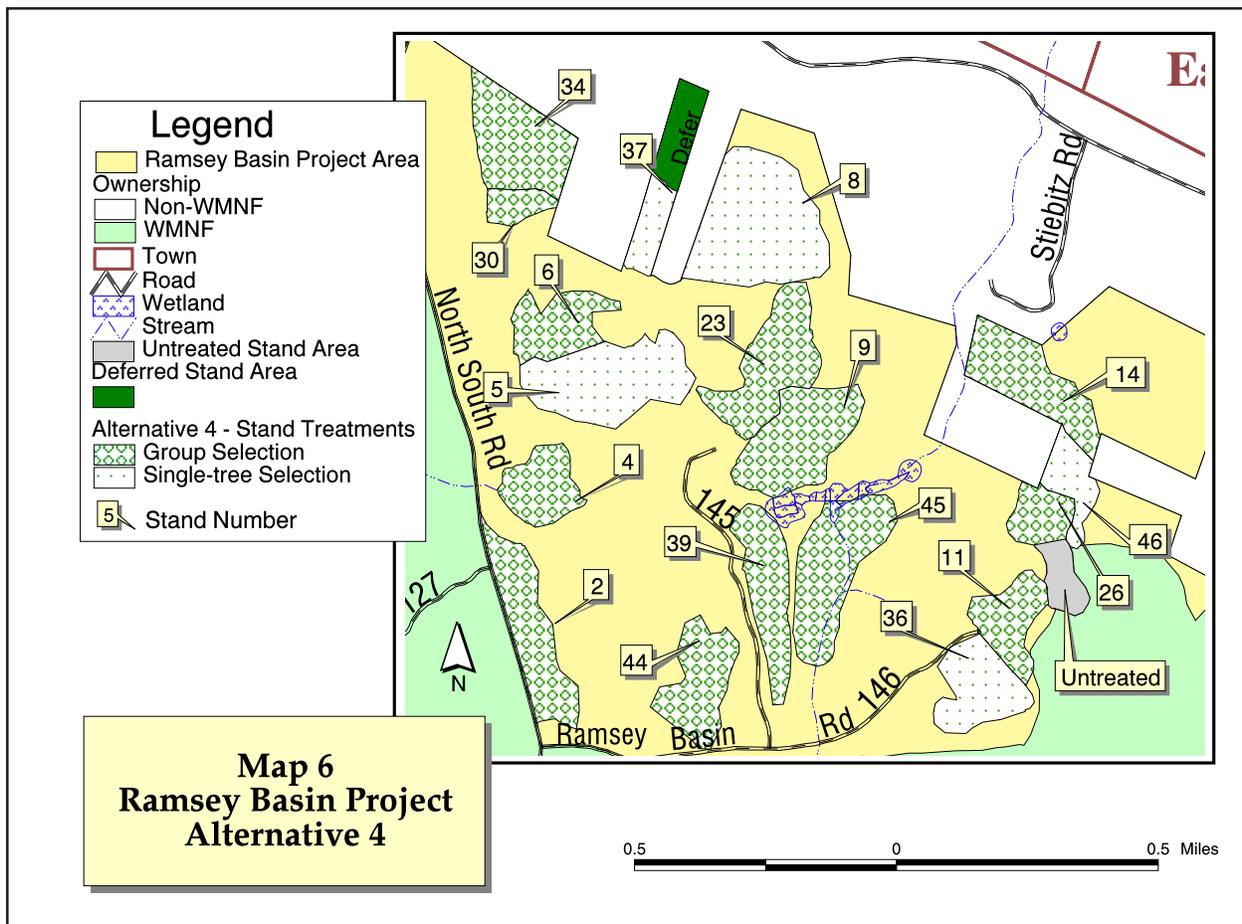
Alternative 4 responds to Issue 1 (p. 10), is a modification of the Proposed Action and proposes only uneven-aged management (single-tree selection and group selection) (Map 6, p. 15, Table 2, p. 16). This alternative was requested by the public.

### Mitigation Measures

In addition to the generally applicable Forest and Management Area-wide Standards and Guidelines listed in the White Mountain National Forest Management Plan in sections III and Appendix VIIB, pp. 18-22. See individual resource sections in Chapter 3 and Endnotes (#2) for a full list of mitigation measures that would be used in the implementation of Alternatives 2-4.

### Comparison of Alternatives

This section includes a comparison of alternatives considered in detail for the Ramsey Basin Project. This section also presents the alternatives in a in the past decade.



## Comparison of alternatives by Forest Plan Direction, Needs, and Activities

The alternatives in the Ramsey Basin Project meet Forest Plan goals and objectives relevant to this project and the needs identified for this project at different levels. The following discussion explains how the activities associated with even- and uneven-aged management meet Forest Plan goals and the project-specific needs.

Alternatives 2-4 use varying combinations of even- and uneven-aged silvicultural systems. Both management systems meet Forest Plan goals of: protecting soil and water; realizing the importance of a natural landscape; recognizing the importance of driving for pleasure; managing for wildlife and recognizing the demand for non-consumptive uses of wildlife; using timber management to achieve desired conditions and integrated resource objectives for certain management areas; provide large volumes of high-quality hardwood sawtimber and other timber products on a sustained-yield basis through intensive management (uneven-aged management is less intensive than even-aged management) and growing small-diameter trees for fiber production.

In addition, even-aged management meets Forest Plan goals of: featuring northern hardwood management over softwoods; culturing high-quality hardwoods; assuring a stable, reliable source of this material for community stability; and increasing wildlife habitat diversity for a full range of species with an emphasis on early-successional habitat (even-aged management will be the predominant silvicultural system, with uneven-aged management used on a site-specific basis); and meeting HMU goals for MA 3.1 lands.

*Ammonoosuc/Pemigewasset Ranger District, White Mountain NF*

For a more complete discussion of Forest Plan Goals and objectives that are pertinent to the Ramsey Basin Project, see Endnotes (#4).

By comparing the amounts of activities for each alternative, a comparison can be made as to how each alternative best meets Forest Plan goals and project-specific needs (Table 2, below).

### Comparison of Alternatives by Issues

The following measures are used to evaluate how the alternatives address the issues:

**Table 2: Comparison of Alternatives by Activities**

Activity	Alt 1	Alt 2		Alt 3		Alt 4	
Timber Harvesting:		Stand Ac	Trt Ac	Stand Ac	Trt Ac	Stand Ac	Trt Ac
<i>Even-Aged Management -</i>							
Clearcutting (northern hardwood, mixed hardwood/softwood)- <i>provides a diversity of wildlife habitats, especially early-successional habitat</i>	0 Ac	81 Ac	69 Ac	44 Ac	40 Ac	0 Ac	
Overstory Removal (spruce/fir) )- <i>provides a diversity of wildlife habitats, especially early-successional habitat</i>		23 Ac					
<i>Uneven-Aged Management -</i>							
Single-Tree Selection (approximately 25% of the stand basal area)		90 Ac	88 Ac	90 Ac	88 Ac	90 Ac	88 Ac
Group Selection (groups range in size from 1/10 to 1 acres; 1/4 acre average; represent approximately 20% of the stand acres) )- <i>provides some diversity of wildlife habitats, and some benefits of early-successional habitat</i>		100 Ac	21 Ac	137 Ac	28 Ac	208 Ac	41 Ac
<b>Total</b>	<b>0 Ac</b>	<b>294 Ac</b>	<b>201 Ac</b>	<b>294 Ac</b>	<b>179 Ac</b>	<b>294 Ac</b>	<b>129 Ac</b>
Road Maintenance (Forest Roads 146 and 147)	0 Mi	1.6 Mi					
Approximate Volume - <i>provides high quality sawlogs and wood fiber:</i>	0 MMBF	1.4 MMBF		1.1 MMBF		0.6 MMBF	

#### 1. Cumulative effect of even-aged management

The amount of clearcutting and overstory removal proposed in this project area will have negative effects on wildlife habitat and visual resources, especially when added to the clearcutting that has occurred on adjacent public and Private land (cumulative impact).

The following measures are used to evaluate how the alternatives address this issue:

**Measurement 1a:** The average early-successional habitat on MA 3.1 lands in HMU 118 provided this decade (through 2014) compared to the desired composition for an “ideal” HMU in the Forest Plan (10%; Forest Plan, III-13)

*None of the alternatives will meet the Forest Plan desired condition of 10%. Alternative 2 would come the closest with approximately 9%, followed by Alternative 3 with 7%, and Alternative 1 and 4 would provide only 3.1%.*

**Measurement 1b:** The amount clearcutting in a cumulative effects area consisting of HMU 118 and an additional 1/2-mile of private land to the north and west of the Project Area.

The distance across private land north of HMU 118 to the nearest National Forest lands directly north of the Ramsey Basin Project Area (Map 3, p. 6, ) is approximately 1/2 mile. A cumulative effects area consisting of HMU 118 and the adjacent 1/2-mile of private land to the north and west was used to assess the cumulative effects of even-aged management on federal and private land on wildlife. Through on-the-ground observation by Forest Service employees and use of aerial photos, it was determined that no current even-aged management (clearcutting/overstory removals) is occurring on private land adjacent to HMU 118, and that there does not appear to be a trend of clearcutting on that private land.

There is an apparent trend towards conversion of forested land to home sites on the private land adjacent to HMU 118. In HMU 118, there has been no conversion of forested land to permanent openings

*No clearcutting is occurring on the private land adjacent to HMU 118. Therefore, there would be no cumulative impact in the HMU 118/adjacent private land cumulative effects area from the clearcutting proposed in the Ramsey Basin Project above that which will occur in HMU 118 (see #1a, above).*

**Measurement 1c:** The North South Road is the only view point for the Ramsey Basin Project Area. The measurement would be temporary openings visible from the North South Road in HMU 118 during this decade (through 2014).

Temporary openings created by even-aged management (clearcutting and overstory removal) exist for approximately 20 years or until the regenerating trees reach sapling size, over 20 feet. At this stage harvested areas are considered sapling stands. There are some sapling stands along the North South Road, south of HMU 118, that were cut in the early 1980s and are now 20-30 feet tall (photo 2), there are currently no temporary openings adjacent to the North South Road in HMU 118. There is one nine-acre clearcut (Titus Brook II Sale) on a hillside west of Long Pond (Photo 1, p.3). Because of the distance (approximately 2 miles) and the location of the stand on the hillside, only four acres are visible from the North South Road.

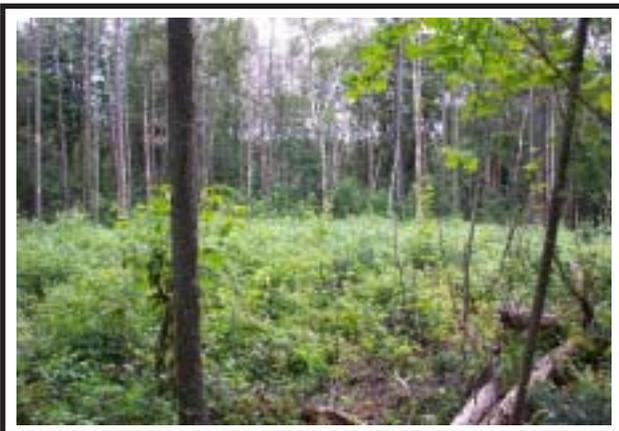
No clearcuts are proposed adjacent to the North South Road in any Ramsey Basin alternative. Stand 4 (Map 4, p. 13), is visible on the other side of a log landing on the North South Road. This stand is proposed for an overstory removal in Alternatives 2 and 3. However, an uncut stand will be left between the landing and the harvested area (cover photo). During leaf-off season some additional light may be visible from the road



*Photo 2: This vehicle is parked on the North South Road adjacent to a 25-year old clearcut. Saplings are 20-30 feet tall, and this stand is no longer considered a temporary opening.*



*Photo 3: Two-year old clearcut in the adjacent Titus Brook II Sale.*



*Photo 4: This view is from the North South Road looking into a two year-old group harvested in Titus Brook II.*



*Photo 5: View into a recently harvested group (Titus Brook II Sale) in a mixed hardwood/softwood stand seen from the North South Road*

through the buffer of uncut trees. No clearcutting or overstory removals will be proposed along the North South Road in the future.

Approximately sixty-five percent (65%) of the lands adjacent to the North South Road have a visual quality objective of Modification, the rest (35%) is Partial Retention.<sup>8</sup> Modification is a visual quality objective which means management activities may dominate the characteristic landscape but must utilize naturally established form, line, color, and texture. This includes even-aged management (clearcutting/overstory removal). Partial Retention is a visual quality objective which means management activities may be evident but remain subordinate to the characteristic landscape (group and single-tree selection).

While much of the lands adjacent to the North South Road has a visual quality objective of Modification, no clearcuts or overstory removals are proposed adjacent to the North South Road in the Ramsey Basin Project, and none are anticipated in the upcoming project in Compartment 45.

*Therefore, the visual quality objectives along the North South Road in HMU 118 will be met.*

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## 2. Long-Term Softwood Component in HMU 118

The vegetative treatments in the Ramsey Basin Project Area will not increase the softwood component that is currently below the Forest Plan desired condition.

The following measures are used to evaluate how the alternatives address this issue:

**Measurement 2a:** The predicted long-term change in hardwood and spruce/fir forest types in HMU 118.

At the landscape level, the softwood component in HMU 118 is limited.

The soil conditions in much of the project area would encourage a gradual shift toward softwood stocking. This is a gradual process of succession that occurs over a very long period of time. Over the foreseeable future, there would be no change in softwood compositions due to Alternative 1.

The treatments proposed in Alternative 2 would maintain the current levels of soft wood composition but would not increase them.

Under Alternative 3, clearcutting is replaced by group selection in 7 stands. These areas have an understory of softwood regeneration that would be encouraged through group selection. By the end of this decade 27 acres of northern hardwoods would be converted to a spruce/fir forest type. If the treatments are repeated in 20-year entries, spruce/fir will increase from 14 to 18% of HMU 118 within 60 years.

In Alternative 4, the remaining clearcuts and overstory removals would be replaced by group selection. The stands prescribed for overstory removal would remain a softwood type, but with a multi-age composition. The stands that would be clearcut in Alternative 3 do not have a softwood understory and would not result in and increase in softwood type.

*Assuming that group selections proposed in this project were to be repeated through three additional entries, at the landscape level (HMU 118) the greatest long-term (60 years ) increase in softwood component would be Alternative 3 or 4 at 20%. In addition if similar treatments were applied in other parts of the HMU, the softwood habitat type could be increased to match Forest Plan goals. Increasing softwood habitat type would provide a more diverse and more balanced wildlife habitat diversity.*

**Measurement 2b:** The predicted long-term effect on wildlife habitat diversity from a change in hardwood and spruce/fir community type in HMU 118.

See discussion in section **2a** above. Assuming that group selections proposed in this project were to be repeated through three additional entries, at the landscape level (HMU 118) the greatest long-term (60 years) increase in softwood component would be Alternatives 3 and 4 at 20%.

*Alternatives 1 and 2 do not increase softwood compositions. Alternatives 3 and 4 increase softwood composition at the expense of clear cutting for early-successional habitat. Alternative 4 produces no early-successional habitat through clearcutting. Alternative 3 provides a balance of habitats. This would come closest to the Forest Plan goal of 22% of spruce/fir habitat (Forest Plan, p. III-13).*

## **Comparison of Alternatives by Anticipated Resource Effects**

Table 3, pp. 21-24 displays a summary of resource effects by each alternative. For a detailed discussion of the affected environment, environmental consequences, and cumulative effects, see Chapter 3, p. 25-84.



Table 3 Comparison of Alternatives by Potential Resource Effects

Resource	Alternative 1	Alternative 2	Alternative 3	Alternative 4
<b>Physical Environment</b>				
<b>Transportation</b>				
<i>Direct/Indirect Effects:</i> Ramsey Basin Project Area - 3.1 Lands in Compartment 44; Approximately 800 Ac	Current road use will continue. Regular planned road maintenance will occur on the FR 19. Activities may include: smoothing, removing debris, cleaning ditches, posting signs and replacing culverts. With no activities taking place, there will be no direct/indirect effects.	Pre-haul maintenance on 1.6 miles of road 6 log landings (5 existing, 1 new; 2.5 ac) 3.7 miles of skid roads (1.6 miles existing, 2.1 miles new; 5.4 acres) Replacement of 1 temporary bridge Snowmobiling would be prohibited during timber harvesting operations		
<i>Cumulative Effects:</i> Compartments 44 & 45; Present - 2016; 1320 Acres	Road maintenance on 0-0.4 miles of road 2 log landings (0.5 ac) 1 miles of skid roads (1.8 acres) Snowmobiling would be prohibited during timber harvesting operations	Road maintenance on 1.6-2 miles of road 8 log landings (3 ac) 4.7 miles of skid roads (4.3 acres) Snowmobiling would be prohibited during timber harvesting operations		
<b>Soil</b>				
<i>Direct/Indirect Effects:</i> Ramsey Basin Project Area - 3.1 Lands in Compartment 44; Approximately 800 Ac	No change from the present	Low risk, minor erosion, mitigated by winter harvest and moderate terrain and no extraordinary soil hazards		
<i>Cumulative Effects:</i> Davis and Witcher Brook Subwatersheds; 1997-2016; 6047 Ac	Limited, on-site, surface soil erosion			
<b>Water</b>				
<i>Direct/Indirect Effects:</i> Ramsey Basin Project Area - 3.1 Lands in Compartment 44; Approximately 800 Ac	No change from the present	There is low risk of short-term, minor effects to water resources associated with temporary stream crossings, skid trails, and landings, because no accelerated soil erosion impact is expected (Direct and Indirect Effects on Soil. Because the potential for short-term effects is low, long-term effects to the water resources are also expected to be low (see Cumulative Effects on Water Resources - Alternatives 1-4).		
<i>Cumulative Effects:</i> Davis Brook Subwatershed (2157 Ac) & Witcher Brook Subwatershed (3890 Ac); 1997-2016	Clearcutting in neither the Davis Brook nor Witcher Brook subwatersheds exceeds 6% over two decades, which is well below the Forest Plan guideline of no more than 25% in one decade. Therefore there are no Cumulative effects to the water resource as a result of activities proposed in the Ramsey Basin Project.			
<b>Air</b>				
<i>Direct/Indirect Effects:</i> Ramsey Basin Project Area - 3.1 Lands in Compartment 44; Approximately 800 Ac	No change from the present	Because of the limited duration of operation of emission-generating equipment associated with timber harvesting, and because this equipment will generally be operated in the winter months, with some exceptions, it is unlikely that the proposed operations would exceed the National Ambient Air Quality Standards. These emissions may contribute to ground level ozone in the project area, but they would be short in duration and limited to the areas of operation on any given day.		
<i>Cumulative Effects:</i> Davis Brook and Witcher Brook Subwatersheds; Present-2016; 6047 Ac	Because of the limited duration of the operation of emission-generating equipment associated with harvesting activities, and because this equipment will generally be operated in the winter months, with some exceptions, it is unlikely that the NAAQS would be exceeded. New large sources of ozone in the cumulative effects area are unlikely since most of the cumulative effects area on the forest and remaining portion on private land is largely undeveloped.			

Table 3 Comparison of Alternatives by Potential Resource Effects cont.

Resource	Alternative 1	Alternative 2	Alternative 3	Alternative 4
<b>Biological Environment</b>				
<b>Vegetation</b>				
<i>Direct/Indirect Effects: Project Area; 800 Ac</i>	Other than aging, no change from present unless from natural causes	Maximizes development of early-successional habitat, in appropriate stands, through even-aged management.	Combines the production of early-successional stands w/conversion of hardwood to increase softwood type.	Maximizes conversion to softwood, where appropriate, but no early-successional habitat is produced.
<i>Cumulative Effects: even-aged management, MA 3.1 lands, HMU 118; 1994-2014 1600 Ac</i>	A maximum of 3.1% in regenerating habitat through the end of the decade	A maximum of 8.8% in regenerating habitat through the end of the decade	A maximum of 7.0% in regenerating habitat through the end of the decade	A maximum of 3.1% in regenerating habitat through the end of the decade
<i>Cumulative Effects: HMU 118 (6100 ac) and an additional 1/2-mile of private land to the north and west of HMU 118 (3300 ac); 1994-2014; 9400 Acres</i>	Based on analysis of aerial photos, discussion with local loggers, and field observations, there is no clearcutting occurring on adjacent private land, and there is no trend towards clearcutting anticipated in the future. The only clearcutting in the cumulative effects area is occurring on federal land in HMU 118 .			
	Anticipates 20 ac of clearcutting/overstory removals on federal lands or 0.3% of the HMU 118 by the end of the decade.	Anticipates 112 Ac; provides 1.8% of HMU118 in early successional habitat by the end of the decade.	Anticipates 83 Ac; provides 1.4% of HMU118 in early successional habitat by the end of the decade.	Anticipates 20 ac of clearcutting/overstory removals on federal lands or 0.3% of the HMU 118 by the end of the decade.
	Anticipates 20 ac or 0.2% of clearcutting/overstory removals in the cumulative effects area by the end of the decade	Anticipates 112 ac or 1.1% of clearcutting/overstory removals in the cumulative effects area by the end of the decade	Anticipates 83 ac or 0.9% of clearcutting/overstory removals in the cumulative effects area by the end of the decade	Anticipates 20 ac or 0.2% of clearcutting/overstory removals in the cumulative effects area by the end of the decade
<i>Cumulative Effects HMU; 2003-2064; 6100 Acres</i>	There would be a slight increase in the proportions of spruce/fir forest type through natural selection but no measurable change in overall species or habitat type	Group selection in 5 stands would convert 20 acres of northern hardwoods EAM forest type to a spruce/fir UEAM forest type at the end of this decade and if treatments are repeated in 20-year entries, Spruce/fir will increase from 14 to16% of the HMU by 6 decades.	Group selection in 7 stands would convert 27 acres of northern hardwoods EAM forest type to a spruce/fir UEAM forest type at the end of this decade and if treatments are repeated in 20-year entries, Spruce/fir will increase from 14 to18% of the HMU by 6 decades.	Group selection in 8 stands would convert 30 acres of northern hardwoods EAM forest type to a spruce/fir UEAM forest type at the end of this decade and if treatments are repeated in 20-year entries, Spruce/fir will increase from 14 to 20% of the HMU by 6 decades
<b>Terrestrial Wildlife</b>				
<i>Direct/Indirect Effects: Project Area; 800 Ac</i>	There would be a slight increase in the proportions of spruce/fir habitat community type through natural selection but no measurable change in overall species or habitat type	Group selection in 5 stands would convert 20 acres of northern hardwoods habitat community type to a spruce/fir hardwoods habitat community type at the end of this decade (14%). Forest Plan goal is 22%.	Group selection in 7 stands would convert 27 acres of northern hardwoods habitat community type to a spruce/fir hardwoods habitat community type at the end of this decade (20%). Forest Plan goal is 22%.	Group selection in 8 stands would convert 30 acres of hardwoods habitat community type to a spruce/fir hardwoods habitat community type at the end of this decade (20%). Forest Plan goal is 22%.
<i>Cumulative Effects: HMU 118, MA 3.1 lands, even-aged management; 2003-2014; 1600 Acres (see cumulative effects for spruce/fir forest type above)</i>	A maximum of 3.1% in early-successional habitat through the end of the decade and a slight increase in the softwood habitat community type.	A maximum of 8.8% in early-successional habitat through the end of the decade	A maximum of 7.0% in early-successional habitat through the end of the decade	A maximum of 3.1% in early-successional habitat through the end of the decade
<i>Cumulative Effects HMU 118, MA 3.1 lands, even-aged management; 2003-2014; 5970 Acres</i>	None of the alternatives would change the habitat community composition by the end of the decade.			
<b>Aquatic resources</b>				
<i>Direct/Indirect Effects: Project Area; 800 Ac</i>	No direct or indirect effects to aquatic resources.	Very low potential for minor localized and short-term direct and indirect effects to headwater portions of Davis Brook.		
<i>Cumulative Effects: Various scales used depending upon the species considered: 10 years</i>	Would add adverse cumulative effect due to lost opportunity to increase open forest canopy for light and solar warmth reaching forest floor and increasing microhabitat for insect forage base for aquatic species.	Increasing open forest canopy for light and solar warmth reaching forest floor increases microhabitat for insect forage base for aquatic species.		

Table 3: Comparison of Alternatives by Potential Resource Effects cont

Resource	Alternative 1	Alternative 2	Alternative 3	Alternative 4
<b>Social Environment</b>				
<b>Heritage</b>				
Direct/Indirect Effects: Ramsey Basin Project Area - 3.1 Lands in Compartment 44; Approximately 800 Ac	No change from present	Mitigation measures will protect known sites during implementation; any new sites will also be avoided and protected.		
Cumulative Effects: HMU 118, Compartments 44-47; present; 6940 Ac				
<b>Recreation</b>				
Direct/Indirect Effects: Ramsey Basin Project Area - 3.1 Lands in Compartment 44; Approximately 800 Ac	Group selection harvesting in Stand 2 would provide a minimal change in the character of the woods for people using the North South Road. The North South Road would be closed to snowmobiling during harvesting operations (2-4 years). The lack of early-successional habitat favors wildlife that depends primarily on mature and over-mature habitat and limits the species that depend on early-successional habitat (game species) for some part of their life cycle. Indirectly, this would reduce the hunting opportunities in the area as well as the ability of visitors to view these wildlife species	Group selection harvesting in Stand 2 would provide a minimal change in the character of the woods for people using the North South Road. The North South Road would be closed to snowmobiling during harvesting operations (2-4 years). Increase in early-successional habitat in Compartment 44 of 10.8 could indirectly increase the opportunity to hunt and view wildlife dependent on this habitat.	Group selection harvesting in Stand 2 would provide a minimal change in the character of the woods for people using the North South Road. The North South Road would be closed to snowmobiling during harvesting operations (2-4 years). Increase in early-successional habitat in Compartment 44 of 7.47% could indirectly increase the opportunity to hunt and view wildlife dependent on this habitat.	Group selection harvesting in Stand 2 would provide a minimal change in the character of the woods for people using the North South Road. The North South Road would be closed to snowmobiling during harvesting operations (2-4 years). The lack of early-successional habitat favors wildlife that depends primarily on mature and over-mature habitat and limits the species that depend on early-successional habitat (game species) for some part of their life cycle. Indirectly, this would reduce the hunting opportunities in the area as well as the ability of visitors to view these wildlife species
Cumulative Effects: HMU 118; 6940 Ac; 2003-2004	Short-term, minor effects to the visual character along the North South Road in Compartments 45-47 North South Road closed to snowmobiling 1-2 years. Decrease in early-successional habitat in HMU 118 from 1.2% in 2003 to 0.3% in could indirectly decrease the opportunity to hunt and view wildlife dependent on this habitat.	Short-term, minor effects to the visual character along the North South Road in Compartments 45-47 North South Road closed to snowmobiling 1-2 years. Short-term, minor effects to the visual character along the North South Road in Compartments 44-47. North South Road closed to snowmobiling 2-5 years. Early-successional habitat in HMU 118 would increase to 2.2% in 2006 and decrease to 1.6% in 2014. Could indirectly maintain the opportunity to hunt and view wildlife dependent on this habitat.	Short-term, minor effects to the visual character along the North South Road in Compartments 45-47 North South Road closed to snowmobiling 1-2 years. Short-term, minor effects to the visual character along the North South Road in Compartments 44-47. North South Road closed to snowmobiling 2-5 years. Early-successional habitat in HMU 18 would increase to 1.8% in 2006 and decrease to 1.2% in 2014. Could indirectly maintain the opportunity to hunt and view wildlife dependent on this habitat.	Short-term, minor effects to the visual character along the North South Road in Compartments 45-47 North South Road closed to snowmobiling 1-2 years. Decrease in early-successional habitat in HMU 118 from 1.2% in 2003 to 0.3% could indirectly decrease the opportunity to hunt and view wildlife dependent on this habitat.

Table 3: Comparison of Alternatives by Potential Resource Effects

Resource	Alternative 1	Alternative 2	Alternative 3	Alternative 4
<b>Social Environment</b>				
<b>Visuals</b>				
Direct/Indirect Effects: The portions of the North South Road adjacent to Compartment 44	No change in the VQO Over time, the continually maturing landscape, as seen the North South Road, would lose visual diversity (vegetative species and age classes).	No change in the VQO Group selection harvesting in Stand 2 would provide minor changes in the character of the landscape as seen the North South Road.		
Cumulative Effects: The North South Road in HMU 118; 1997-2016	The VQO of Partial Retention is maintained - no clearcuts visible from the road. Group selection harvesting in Compartments 45-47 would provide minor changes in the character of the landscape as seen the North South Road. No clearcutting (temporary opening) is expected to take place along the North South Road in HMU 118 or on private land north of HMU 118.	The VQO of Partial Retention is maintained - no clearcuts visible from the road. Group selection harvesting in Compartments 44-47 would provide minor changes in the character of the landscape as seen the North South Road. No clearcutting (temporary opening) is expected to take place along the North South Road in HMU 118 or on private land north of HMU 118.		
<b>Community, Economic, &amp; Environmental Justice</b>				
Direct/Indirect Effects: Ramsey Basin Project Area - 3.1 Lands in Compartment 44; Approximately 800 Ac	Loss to the US Treasury = <b>-\$49,280</b> Potential Timber Tax generated for Town of Benton = \$0	Limited seasonal employment opportunities from timber harvesting activities Net to US Treasury. = \$114,853 Potential Timber Tax generated for Town of Benton = \$22,643	Limited seasonal employment opportunities from timber harvesting activities Net to US Treasury. = \$79,682 Potential Timber Tax generated for Town of Benton = \$17,791	Limited seasonal employment opportunities from timber harvesting activities Net to US Treasury. = \$20,991 Potential Timber Tax generated for Town of Benton = \$9,704

# Chapter 3 - Affected Environment, Environmental Consequences, & Cumulative Effects

## Introduction

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Chapter 3 displays the current condition of the resources within the project area and the analysis of direct, indirect and cumulative effects of alternatives for the Ramsey Basin Project. It also presents the scientific and analytical basis for comparison of alternatives presented in the Chapter 2 above.

### Forest Plan References to Cumulative Effects.

This environmental assessment is tiered to the Forest Plan Final Environmental Impact Statement (FEIS) (USDA, 1986) in which some of the cumulative effects have been previously discussed. The analysis of potential cumulative effects have been reviewed during the site-specific analysis performed for this project and are consistent with site-specific effects

Recreation	pp. IV-58 to IV-59
Roads	p. IV-59
Timber	p. IV-60
Visual	pp. IV-60 to IV-62
Wildlife	pp. IV-62 to IV-64
Economic Resources	p. IV-64
Community Well-Being	pp. IV-65 to IV-66
Soils and Water	p. IV-66
Air Quality and Noise	p. IV-66
Cultural resources	p. IV-66

### General Cumulative Effects

Cumulative effects consider the impacts of proposed projects on a landscape scale across time and space. Cumulative effects analysis examines the effects of other activities, on National Forest and private land that may occur across the landscape but may not readily be apparent at a smaller scale.

Cumulative effects will be analyzed under each resource area, and the reason for choosing specific cumulative effects criteria will be explained in the individual cumulative effects analyses.

## Physical Environment

### Transportation Facilities

No Unresolved Issues Related to Transportation Facilities

#### Transportation Facilities Affected Environment

The table below, displays the inventory numbers, names, and lengths for the Forest Service classified roads within the Ramsey Basin Project Area.

The Ramsey Basin Project Area contains 3.3 miles of Forest Service “Forest Development Roads” (FR). The North South Road (FR19) is the western boundary of the Project Area (1.7 mi). With a Project Area of approximately 1.3 square miles (800 acres), the density of Forest Roads is 2.5 miles per square miles of Forest Service administered land.

The North South Road, FR19, a Type III (“roads seasonally open to the public”), is closed in the late fall when the surface becomes slick due to ice and snow. This road is also used as a snowmobile trail in the winter, when the road is not used for timber hauling. This road is in excellent condition.

FR145 and FR146, Type I “roads that are not open to the public” for motorized access, are gated closed. The culverts were removed subsequent to the last entry, and water bars were installed. These roads would need to be restored to the original operating condition before it could be used for vehicle access again.

Besides the Forest Roads, there is a more extensive network of old travelways within the project area.

This includes old farm roads and skid trails, most of which predate the National Forest, and most of which might be called “unclassified roads” under the 2000 transportation rules.

**Table 4: National Forest System Roads (FR) within the Nubble Project Area (Map 1)**

FS Road	Road Name	Total Length Within Project Area
FR 19 <sup>a</sup>	North South Road	1.7 Miles
FR 145 <sup>b</sup>	Davis Brook Road	0.7 Miles
FR 146 <sup>b</sup>	Ramsey Basin Road	0.9 Miles
<b>Total</b>		<b>3.3 Miles</b>

<sup>a</sup> The road is gated shut when ice and snow accumulate making travel unsafe in the fall/winter. Portions are open to snowmobile traffic during the winter. Open to vehicle travel in the late spring, and usually before Memorial Day weekend.

<sup>b</sup> Gated shut year around

#### Transportation Facilities - Related Mitigation Measures

In addition to the generally applicable Forest-wide and Management Area Standards and Guidelines listed in the Forest Plan (Chapter III and Appendix VIIB, pp. 18-22), the following specific mitigation or coordination measures would be used to implement timber harvest operations within the project area, unless listed as optional:

- For public safety, close the North South Road (FR19) during winter operations, signs posting indicating “No Snowmobiling” at all entry points to Forest Road 19. These signs would be required by the sale contract. Coordination with snowmobile clubs will occur prior to sale activity. This coordination would be required in the sale contract.

- For visual considerations, groups in Stand 2 will be placed no closer than 66 feet from the North South Road.
- For visual considerations, along the edge of the North South Road (FR19), all slash from purchasers operations will be removed a distance of 50' and lopped to within 3' of the ground for another 50'.
- Roads would be closed to use and hauling in wet seasons during spring when frost leaves the roads and soils are saturated, in order to reduce road damage. All drainage structures, filtering areas, decelerators and sediment traps would be maintained.
- The exact location of log landings, main skid trails and stream crossings would be agreed upon in advance with the sale administrator and District staff in order to reduce the impact from transportation corridors and potential for sediment reaching stream courses, to minimize disturbance, and to protect TEPS plant species, . The size or location of log landing locations will not be altered without the approval of the sale administrator.
- Upon completion of harvesting operations, any temporary roads constructed to facilitate access will be closed and obliterated to reduce the impact from transportation corridors and potential for sediment reaching stream courses.

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### **Direct and Indirect Effects on Transportation Facilities**

No road construction is planned for any alternatives. The existing road density of 1.2 miles of road per square mile would not change under any alternative.

#### *Alternative 1 - No Action*

Harvesting is deferred on National Forest lands suitable for timber harvest (as described in the LRMP) within the project area until some later time. Current road use will continue. Regular planned road maintenance will occur on FR19. Activities may include: smoothing, removing debris, cleaning ditches, posting signs and replacing culverts. With no activities taking place, there would be no direct/indirect effects.

#### *Alternatives 2-4*

The stands proposed for treatment in Alternatives 2-4 are the same. The difference between Alternatives is in the individual stand prescriptions. Therefore, the effect to the transportation facilities will be the same for all action alternatives.

Implementation of timber harvesting in Alternatives 2-4 would require approximately six (6) landings. Five (5) of the landings are already in place, and one new landing would be required. Some trees and saplings would need to be cleared before the existing landings can be used. The remaining landing would need to be constructed. Landing location and use would be agreed to between the purchaser and the Forest Service prior to implementation.

A ground-based logging system would be used for harvesting timber. All products would be moved to the landings using rubber-tired skidders. Forest Service personnel must approve in advance the primary skid trail locations, including any stream crossings and the method used to cross the streams. Skid trails would utilize existing corridors (1.6 miles) wherever possible, typically old temporary roads and skid trails. In situations where new corridors (2.1 miles) would be needed to skid wood, they would be constructed in accordance with the standards and guidelines established in the 1986 LRMP.

To implement Alternatives 2-4, road restoration (road maintenance) would be required for approximately 1.6 miles of existing Forest Service roads. As defined by the 1986 LRMP, maintenance is the rebuilding of an existing road to its original standard. In this case, it would generally require removing or opening closure devices and replacing water bars with culverts or other drainage structures. It would mean removing brush from the travelway and ditches, cleaning and re-establishing ditch lines and drainage patterns, curve widening where necessary, spot surfacing, and grading.

During winter harvesting operations, the North South Road (FR19) would be managed to accommodate timber harvesting and snowmobile traffic will be prohibited.

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### Cumulative Effects on Transportation Facilities

HMU 118 includes Compartments 44-47. Harvesting in Compartment 46 (Howe Hill Timber Sale) occurred in 1997. Harvesting in Compartment 47 (Titus Brook) was completed in the winter of 2003. Harvesting in Compartment 44 (proposed Ramsey Basin Project) would be completed in 2006/7. There is a proposed project for Compartment 45 that could begin in 2006/7. Through 2016, no harvesting is anticipated in Compartments 46 and 47 and harvesting could occur in Compartments 44 and 45. Therefore, the cumulative effects area for transportation facilities is Compartments 44 and 45 through the year 2016. Treatment acres in Compartment 45 could be 60 acres. Associated with that could be 2 landings, 1 mile of skid roads, and 0.4 miles of road maintenance on FR 146. If the implementation of projects in Compartments 44 and 45 overlap, additional road maintenance may not be necessary.

### Soils

No Unresolved Issues Related to Soils

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### Soil Affected Environment

The Ramsey Basin Project Area has soils common to many other areas across the White Mountain National Forest. It contains deep, moderately well and well-drained fine sandy loams on 10-25% slopes. These soils correspond to areas of “suitable” land base where timber management is allowed on the Forest (MA 2.1 and 3.1). The soil erosion risk is high, relative to other soils across where timber management occurs. Through careful selection of season of harvest, timely application of standards and guidelines, and routine road maintenance on permanent roads, soil erosion, based on previous experience at this site, and on similar soils across the Forest, is limited and site-specific. . There are no soils subject to deep soil slump or dry debris slide. There is no on-the-ground evidence of surface soil erosion on roads or previously used skid trails in the Ramsey Basin Project Area.

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### Soil - Related Mitigation Measures

All applicable Forest Plan standards and guidelines would be met. There are no additional project-specific mitigation measures.

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### Direct and Indirect Effects on Soil

#### *Alternative 1- No Action*

Road maintenance of the North South Road will occur with, or without, this proposed sale. Surface grading, maintenance of the ditch-line, and culvert maintenance actually prevents accelerated soil erosion by preventing channeling water. Forest Service Roads 145 and 146 are unused during the snow-free season, and no soil erosion is expected on its stabilized surfaces.

*Alternative 2 - Proposed Action*

Pre-haul maintenance of Forest Roads 145 and 146 would disturb the soil surface and lead to some re-distribution of mineral soil. Gentle grades, good ditches and properly maintained cross drains would prevent accelerated soil erosion. Winter harvest of all cutting units would lead to little, if any, exposure of mineral soil because the snow cover and frozen ground minimizes disturbance of the protective soil organic matter layer. Generally gentle terrain also contributes to minimizing disturbance because the skidder is less apt to churn its tires. Log landings would experience soil compaction from repeated truck traffic, and mineral soil would be exposed to erosion hazard. However, flat terrain selected for landings combined with frozen ground harvest would limit the likelihood of accelerated soil erosion. Also, if there is a water issue, it can be dealt with quickly.

*Alternative 3 - Modified Proposed Action*

This alternative reduces the harvest by 22 acres. This reduces the acres that need to be accessed by skidder, but not the miles of truck road, landings, or season of harvest. The road and landing impact, therefore, is the same as the Proposed Action. The intensity of skidding impact is the same as the Proposed Action, but the magnitude of impact is smaller because of fewer treated acres. No accelerated soil erosion impact is expected for the same reasons as described in the Proposed Action. The change in harvest volume is not likely to extend the period of harvest, and thereby potentially affect the likelihood of soil erosion.

*Alternative 4*

This alternative reduces the harvest by 79 acres from the Proposed Action. This change is not related to reducing the soil erosion hazard because of some extraordinary risk. It is to address other issues, such as the Modified Proposed Action. Therefore, it does not alter the intensity or magnitude of road impacts. However, it does reduce the magnitude of the skidder impacts. In any event, the magnitude of soil erosion impact still remains small because of the same factors already described. Relative to other alternatives, the risk of accelerated soil erosion is the least under Alternative 4.

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**Cumulative Effects on Soil**

Soil erosion cumulative impacts considered include the Davis Brook and Witcher Brook sub-watersheds because these areas include road use potentially affected by this sale. The period of analysis includes the Boutin Corner and Titus Brook Sales of which all activity will be completed in 2004. The only known future activity is in Compartment 45, which lies south of this area in HMU 118.

There is no on-the-ground evidence that past sales or road maintenance has lead to accelerated surface soil erosion. All skid trails, and landings, are re-vegetated. All clear-cuts are adequately re-stocked. Road maintenance of the North South Road is scheduled, and so no reason exists to believe it will be a source of accelerated soil erosion. The potential future sale in HMU 118 does not include any soil with extraordinary erosion, slump or debris hazards, that, when combined with the current soil erosion, might lead to major soil erosion. By the time this sale occurs, the Proposed Sale is likely to be complete, and all roads stabilized, so there is no reason to believe this sale would in any way predispose a future sale to accelerated surface soil erosion.

**Water Resources**

No Unresolved Issues Related to Water Resources

## Water Resources Affected Environment

See also the Soil Resource section for a discussion of the physical attributes of soil erosion as they relate to water resources.

The Ramsey Basin Project Area is located in portions of the Davis Brook and the Witcher Brook subwatersheds, which are part of the Wild Ammonoosuc River watershed.

The New Hampshire Department of Environmental Resources lists Davis and Witcher Brooks as Class A, indicating the highest water quality classification. No discharge of sewage or waste is allowed into the waters of this classification. The water is considered usable as a source of drinking water after adequate treatment.

Timber harvesting has been an ongoing part of management in this Ramsey Basin Project Area as well as in the larger subwatersheds. Past timber harvesting in the project area concluded in the early 1980s. Landings and skid roads associated with previous timber sales in this subwatershed are generally overgrown and/or covered with leaf litter, thus minimizing the impact of raindrop splash, which can be a precursor to soil erosion and indirectly to stream turbidity.

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## Water Resources - Related Mitigation Measures

Forest Plan standards and guidelines and best management practices (BMPs) would be followed with regard to all activities.

- To reduce potential for sediment reaching stream courses, designate major skid trails and minimize the number of stream crossings.
- To reduce potential for sediment reaching stream courses close roads to use and hauling in wet seasons. Maintain drainage structures, filtering areas, decelerators and sediment traps.

For a detailed list of roads and associated activities affecting Water Resources, see Table 4, p. 26. Also, see Soil discussion above.

### *Alternative 1*

No direct or indirect effects to water quality are expected from the implementation of Alternative 1 (No Action) other than those that may already be occurring naturally. The current condition would remain. Streams and riparian areas would continue to function much in the same way as present.

### *Alternatives 2-4*

Under all action alternatives trees would be felled away from streams and riparian areas to reduce effects that might result from the felling operation and skidding downed trees. Logging debris would be kept out of riparian areas and streams with defined channels, and existing woody material would be left in place.

There is low risk of short-term, minor effects to water resources associated with temporary stream crossings, skid trails, and landings, because no accelerated soil erosion impact is expected (Direct and Indirect Effects on Soil, pp. 28-30, above). In addition, no long-term effects are expected. Buffers, treatment restrictions around streams and riparian areas, and designated stream crossings avoid potential effects to the water resource. Buffers for perennial streams in the project area have been incorporated. Because the potential for short-term effects is low, long-term effects to the water resources are also expected to be low.

As harvesting operations are concluded, temporary stream crossings would be removed and stabilized. Mitigations are expected to reduce effects of this disturbance to the short term. The existing roads, landings, and skid trails provide an example of what these facilities would be in several years after use, when all appropriate mitigations and standards and guidelines are followed. Skid trails and landings would be vegetated and stabilized. As harvesting is completed, material used for temporary stream crossings would be removed, and the temporary bridge used to cross Davis Brook would be removed.

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**Cumulative Effects on Water Resources -Alternatives 1-4**

In general, as water flows downstream, pollutants are mobilized into the stream system, and any changes in the water resources related to a project merge with other waters within the larger watershed. The two subwatersheds in which the Ramsey Basin project is located flow into the larger Wild Ammonoosuc watershed. However, the larger scale of this watershed would make it difficult to discern any cumulative effects related to the Ramsey Basin Project Area.

The cumulative effects discussion on water resources reference the subwatersheds of Davis Brook (6,700 ac) and Witcher Brook (3,890 ac). All of the units proposed for harvesting in the Ramsey Basin Project Area are within the boundaries of these subwatersheds, as described. The cumulative effects time period is from the present 2004 (the time period during which an effect of previous and existing harvesting might have an effect on the cumulative effects area) through 2019 (10 years after the anticipated effects of harvesting in the Ramsey Basin Project Area and any future harvesting that might occur in Compartment 45 might have an effect).

The Davis Brook subwatershed contains 1.6 miles of state and local paved roads, 0.6 miles of local unpaved roads, and 2.2 miles of unpaved Forest Development Roads. The Witcher Brook subwatershed has 0.7 miles of state and local, paved roads and 7.4 miles of unpaved Forest Development Roads. These unpaved roads were built and are managed according to the standards and guidelines of the 1986 Forest Plan, which were devised to minimize soil erosion. These practices have been used effectively since the early 1970s. Permanent soil compaction will exist on these road locations, as anticipated in the 1986 Forest Plan FEIS.

Table 5, p. 32, displays the percent of land ownership within the subwatersheds.

To protect against potential cumulative effects on water resources generated by additional runoff following timber harvesting, the Forest Plan includes the following standard and guideline:

*Within a ten-year period on a 1,000-acre or larger watershed, no more than 25% of the total area (comparable to 25% of basal area) will be clearcut (Forest Plan Standard and Guideline, III-17).*

**Table 5: Subwatershed Ownership**

Subwatershed	Ownership	
	Federal	Private
Davis Brook	47%	53%
Witcher Brook	94%	6%

The last three timber sales in these subwatersheds began in the late-1990s and was closed in the winter of 2004 (Boutin Corners, Howe Hill, and Titus Brook). Future activities could include Ramsey Basin and Compartment 45. Table 6, p.32, displays harvesting activities that could contribute to a cumulative effect on water resources as a result of the Ramsey Basin Project.

Table 6 shows that all of the alternatives would result in an overall basal area reduction well below the 25% that would result in detectable water yield increases per local and relevant Hubbard Brook studies, and would be within Forest Plan Standards and Guidelines. Therefore, no measurable increases in water yield are expected to occur at this level, and, therefore, no associated cumulative effects would occur.

**Table 6: Cumulative Basal Area Removed through Clearcutting or Overstory on Federal Land by Subwatershed Between 1997 and 2016**

Project	Completed	Davis Brook	Witcher Brook
Compartment 47 - Titus Brook	2003	0 Ac	6 Ac
Compartment 46 - Howe Hill	1997	0 Ac	6 Ac
Compartment 45	2010	10 Ac	10 Ac
Compartment 44 - Ramsey Basin	2006/7	0, 69, 40, 0 Ac (Alts 1-4)	23 Ac
Boutin Corners	2004	59 Ac	NA
<i>Total Ac that could be cut between 1997 and 2016</i>		<i>59, 128, 99, 59 Ac (Alts 1-4)</i>	<i>55 Ac</i>
<i>Percent of subwatershed that could be harvested between 1997 and 2016</i>		<i>3, 6, 5, 3% Alt 1 &amp; Alts 2-4)</i>	<i>1%</i>

The private lands located in the Davis Brook and Witcher Brook subwatersheds are located outside of the Ramsey Basin Project Area. Ongoing and future soil-disturbing activities on private lands in the subwatersheds include roadwork, a minor amount of housing construction, and timber harvesting (no evidence of clearcutting) (Wingate, 2003). It is not known what amounts of these activities would occur in the future, but the activities would be restricted to private land. However, all activities are required to follow State of New Hampshire Best Management Practices or regulations to protect soil and water resources. The activities on non-federal land are not expected to contribute to the potential cumulative effects from the Ramsey Basin Project. It is expected that all streams within the two subwatersheds would maintain their Class A status.

*Alternatives 1-4*

Over two decades (1997-2016), there is the potential to clearcut approximately 3-6% of the Davis Brook and 1% of the Witcher Brook subwatersheds on federal land (Table 5, above). There is no evidence of a trend towards clearcutting on private land in these two subwatersheds (personal observation, Wingate, 2003; aerial photos). The amount of harvesting in these two subwatersheds is well below the Forest Plan guideline of 25% in any 10-year period. Therefore, there are no long-term cumulative effects on water resources from clearcutting in these subwatersheds.

In summary, Alternatives 2-4 propose activities that would be mitigated using BMPs and standards and guidelines from the 1986 LRMP. This would result in only short-term disturbance on a relatively small portion of the watershed. Therefore, there is a low risk of cumulative effects on water quality, water quantity, or on water resources within the Davis Brook and Witcher Brook subwatersheds from any of the action alternatives.

**Air Quality**

No Unresolved Issues Related to Air Quality

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## Air Quality Affected Environment

The Ramsey Basin Project Area, located in the White Mountains airshed, is about 27 miles from the Presidential Range-Dry River Wilderness and 33 miles from the Great Gulf Wilderness Area - mandatory Class I areas on the White Mountain National Forest. The Project Area is located on the north slopes of the predominately east west trending valley of Wild Ammonoosuc River. Winds in the area are dominated by mountain valley dynamics interacting with large-scale atmospheric movements (USDA, 2002).

Air pollution that originates in the Project Area is mostly related regional sources as well as local sources of dust from roads and vehicle emissions. Wood burning contributes particulates and carbon monoxide to the air. Dust from roads contributes particulates. Vehicle emissions are associated with hydrocarbons, carbon monoxide, nitrogen dioxide, and lead. None of these sources is expected to exceed New Hampshire or federal ambient air quality standards except for short time periods from wood stoves, wildland fires, and prescribed fires. Wildland and prescribed fire do not occur in the area at a large scale.

The project area is not located in a non-attainment area for any of the National Ambient Air Quality Standards (NAAQSs). The closest non-attainment area is for ozone and is located in the southern counties of New Hampshire, Merrimack, Cheshire, Hillsborough, Rockingham, and Strafford Counties. The occurrence maps show that ozone appears to originate around large urban centers and migrates northward to the White Mountain region during times of high temperature and air stagnation. The project area is about 43 miles from the closet point of Merrimack County.

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## Air Quality - Related Mitigation Measures

There are no mitigation measures for air quality. This is because effects related to air quality related to the action alternatives are expected to be very short term. Although not a specific mitigation for air quality, winter operations would reduce dust from road use by logging traffic.

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## Direct and Indirect Effects on Air Quality

The primary source of any concern for air quality within the project area is the use of heavy equipment and gas-operated tools during timber harvest and road maintenance operations. Emissions from motor vehicles, heavy equipment and gas-operated chainsaws could directly affect air quality in the project area. The most significant emissions from diesel motors used to operate heavy equipment and some motor vehicles are nitrogen oxides (NO<sub>x</sub>) and particulate matter, both of which contribute to public health problems in the United States. Nitrogen oxide emissions from diesel vehicles play a major role in ground-level ozone formation that is most problematic in the summer months.

### *Alternative 1- No Action*

No activities are proposed; and no additional emissions are expected to take place within the project area, beyond what occurs now. Forest Service classified roads will continue to receive their scheduled level of maintenance, and the North South Road will continue to be used for dispersed recreation in the summer and fall, and as a snowmobile trail in the winter. Existing emissions are currently contributing to the air quality condition described in the affected environment as well as the larger scale air quality issues discussed in the cumulative effects section of this report.

### Alternatives 2-4

The direct effect of timber harvesting and road maintenance activities proposed in these action alternatives is the emission of NO<sub>x</sub> and particulate matter resulting from the use of heavy equipment, diesel-operated motors, gas-operated chainsaws, and other tools. However, because of the limited duration of operation of this emission-generating equipment, and because this equipment will generally be operated in the winter months, with some exceptions, it is unlikely that the proposed operations would exceed the NAAQS. Since ground level ozone is worst during summer months, winter harvesting would minimize this effect so that ozone is unlikely to form at elevated levels as a result of the proposed activities. These emissions may contribute to ground level ozone in the project area, but they would be short in duration and limited to the areas of operation.

### Cumulative Effects on Air Quality - Alternatives 1-4

The cumulative effects area for air quality is the Davis Brook and the Witcher Brook subwatersheds, as previously described, because the potential effects to air quality generated by any of the proposed activities are likely limited to those areas of operation within the project area, and they are not expected to extend any further. The time frame considered in this analysis is from the present through 2016. A vegetation project may occur in Compartment 45, directly south of the Ramsey Basin Project Area. There is the potential that harvesting in the two areas could overlap by a year.

Under Alternative 1, the existing condition and trends as described in the affected environment would remain much the same, plus the emission-generating equipment associated with harvesting activities in Compartment 45. However, because of the limited duration of operation of this emission-generating equipment, and because this equipment will generally be operated in the winter months, with some exceptions, it is unlikely that the proposed operations would exceed the NAAQS. Future vehicle emissions are likely to increase as more visitors come to the White Mountain National Forest. This could contribute to ground level ozone levels when conditions are suitable. New large sources in the cumulative effects area are unlikely since most of the cumulative effects area on the forest and remaining portion on private land is largely undeveloped.

For the reasons stated above, the cumulative effects for Alternatives 2-4 would be the same as Alternative 1.

## Biological Environment

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### Vegetation

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#### Vegetation Affected Environment

**Issue 1:** The amount of clearcutting and overstory removal proposed in this project area will have a negative effect on wildlife habitat and visual resources, especially when added to the clearcutting that has occurred on adjacent public and private land (cumulative impact) (public, see p. 10).

**Measurement 1b:** The clearcutting in a cumulative effects area consisting of HMU 118 and an additional 1/2 mile of private land to the north and west of the Project Area.

**Issue 2:** Some of the vegetative treatments in the Ramsey Basin Project Area will not increase the softwood component in HMU 118 and softwood type is currently below the Forest Plan desired condition (public, see p. 10).

**Measure 2a:** The predicted long-term change in hardwood and spruce/fir habitat community in HMU 118 compared to the existing and desired composition for an “ideal” HMU in the Forest Plan (LRMP, p. III-13).

### Woody Vegetation

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

For a vegetative history of the project area, see Ramsey Basin project file.

At the landscape level, the aspen-birch, spruce-fir, and hemlock forest communities on MA 3.1 lands in HMU 118 do not meet Forest Plan desired conditions (figures 2 and 3, p. 36).

Within Ma 3.1 lands in HMU 118, there is a predominance of northern hardwood forest (85% in even age stands and 84% in un-even age stands). Species content, site factors, and other resource values have been analyzed for each stand to determine if even-aged or uneven-aged management is the most desirable type of silvicultural management.

Of the stands being proposed for treatment, three stands (28 acres) are spruce/fir type and 15 stands (270 acres) are northern hardwoods. These stands are at a seral stage where a treatment is recommended based upon the current stand condition, management objectives, Forest Plan standards and guidelines, and the respective Silvicultural Guides. The silvicultural prescriptions contained in the project file describe this in more detail.

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### Vegetation - Related Mitigation Measures

- To preserve and protect minority species, thus enhancing diversity, indigenous, minority tree species or beech trees genetically resistant to scale complex would be encouraged in uneven-aged treatments by cutting trees around them that compete for space and resources. In even-aged regeneration treatments, these species would be protected and buffered with a group of other leaf trees.
- To provide growing space for a mix of desirable trees and to meet Forest Plan wildlife habitat diversity objectives, in clearcuts/overstory removals, a mix of residual trees would be left to improve wildlife habitat, modify the visual appearance of the stand and add diversity to the composition of the future stand. In clearcuts or group selection treatments, where residual understory plants interfere with the germination and development of desirable tree seedlings, a mechanical site preparation treatment would be used to control low shade. If seedlings develop, but are controlled by residual vegetation, a release treatment (TSI) would be applied by removing some of the interfering woody vegetation.
- To protect TEPS plant species, if listed plants are found during project implementation, the sale administrator would alert the district biologist and botanist and protective measures would be taken.
- To protect soils and TEPS plant species via frozen ground conditions, winter harvest only.

Figure 2: Desired/Existing Forested Community Types on Even-Aged Management  
Lansa, MA 3.1, HMU 118

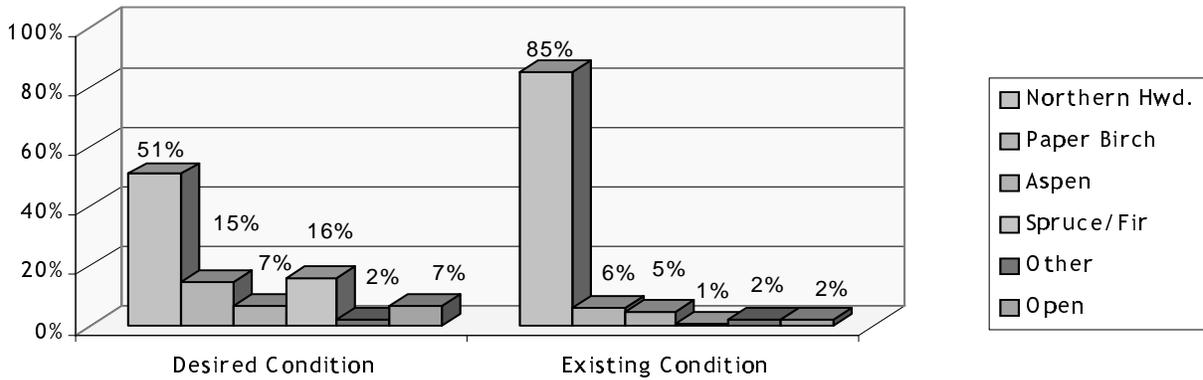
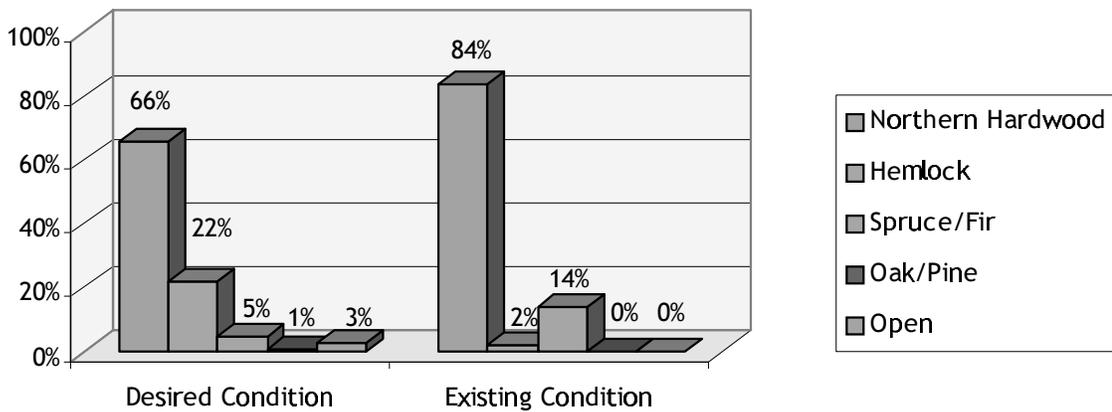


Figure 3: Desired/Existing Forested Community Types on Uneven-Aged Management Lands, MA 3.1, HMU 118



- To insure successful regeneration takes place, and that species mix meets treatment objectives, regeneration treatments, even- and uneven-aged, will be followed by surveys to determine the success of natural regeneration. If natural regeneration fails, then new trees grown from local seed sources would be planted. If species mix is not meeting objectives or if there are desirable, minority of wildlife trees being suppressed, a timber stand improvement (TSI) treatment will be used to release a desirable mix of young trees.
- To minimize disturbance and to protect TEPS plant species, the location of log landings and skid trails will be agreed upon in advance with District sale administrator.
- To prevent introduction of noxious invasive weed species, use native vegetation and straw (when available) during revegetation practices per Executive Order 13112, 23/99.

**Direct and Indirect Effects on Vegetation**

The direct/indirect effects area is the Ramsey Basin Project Area.

The general effects of timber harvesting activities on vegetative diversity can be found in the Forest Plan FEIS, pp. IV-32 and IV-33.

*Alternative 1*

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

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

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

Table ,7 p.38, displays the differing silvicultural treatments for Alternatives 2-4.

**Table 7: Comparison of Silvicultural Treatments by Alternative**

Activity	Alternative 1		Alternative 2		Alternative 3		Alternative 4	
	Stand Acres	Treatment Acres						
<b>Even-Aged Management</b>								
Clearcutting	0	0	81	69	44	40	0	0
Overstory Removal	0	0	23	23	23	23	0	0
<b>Uneven-Aged Management</b>								
Single-Tree Selection	0	0	94	88	94	88	94	88
Group Selection	0	0	100	21	137	28	204	40

*Alternative 2 - Proposed Action*

Ninety-two (92) acres of mature trees would be regenerated. Overstory removals on 23 acres would replace the existing spruce/fir type with young growth of the same species previously created by a shelterwood cut. Species content in clearcut treatments would shift more towards shade intolerants such as aspen, paper birch, and white ash. The disturbance may encourage regeneration of yellow birch, or hemlock. A few species of woody or herbaceous vegetation, seeds of which have a long period of dormancy, such as raspberry and pin cherry, would have an opportunity to germinate and become part of the ecosystem for a period of time. This would increase species diversity.

Stands planned for group selection (21 treatment acres) would have regeneration cuts that are small in size, 1/10 to 1 acres (average ¼ acre), and are located throughout the stand. These groups would regenerate, on average, 20% of the stand area. Group selection would continue to be practiced in these stands in future management entries. Regeneration would tend toward a broad mix of shade-intolerant, intermediate, and shade-tolerant species. Nearly all the species currently represented in the stored seed mix, or those originating from nearby seed trees, would have an opportunity to germinate and grow in these varied light conditions. There would be some variation in species mix from year to year due to seed periodicity and dispersal. Where advanced regeneration is present as spruce and fir is in the mixed hardwood/softwood stands, it will be strongly represented in the resulting stocking. The amount of ground disturbance can affect species content. Disturbance would favor the establishment of raspberry, paper birch, and yellow birch.

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

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

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

### *Alternative 3*

Alternative 3 proposes most of the activities from Alternative 2 but changes clearcutting planned for stands 9 and 39 to group selection. These stands have pockets of advanced softwood regeneration and the soils are suitable for spruce and fir. Using group selection in these stands will produce more spruce/fir habitat in the future.

### *Alternative 4*

Alternative 4 proposes the same uneven-age treatments as alternative 3 and changes even-aged management prescriptions, clearcuts and overstory removals, to uneven-aged management, group selection. Group selection is a viable treatment for these stands. They will be regenerated but over a longer period of time. A portion of the stocking, which is in between the groups and composed of short-lived and/or shade-intolerant species, will die before it can be harvested. Resulting regeneration will be more shade tolerant.

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## **Cumulative Effects on Vegetation**

The Management Area 3.1 lands in Habitat Management Unit 118 Cumulative Effects Area (Map 2, p. 4 & 3, p. 6) is used for vegetative cumulative effects analysis through the end of the decade 2014. This analyzes changes in habitat types resulting from different alternatives can be measure across the HMU and compared with forest plan standards. These are the lands that are allocated to vegetative management in the Forest Plan. Similar treatments to those proposed in the Ramsey Basin Project, but on a smaller scale, are anticipated in compartment 45 before the end of the decade (2014). The time period covers the past and up coming decades (1994-2014), because forested age classes occur in ten-year increments, and the regenerating age class is 0-9 years old.

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

There are approximately 2,040 acres, within the MA/HMU cumulative effects area. There is a lack of regenerating age class in 3.1 lands across the HMU. Clearcutting provides a means of increasing this age class

### *Alternative 1*

The overall effects would be the same as those discussed under direct/indirect effects but across the cumulative effects area as a whole. There would be no additional harvesting in Alternative 1. Regeneration cutting already completed in comps 46 and 47 would continue to grow. By 2013 there would be no early successional habitat in the HMU unless there were a natural event. Twenty acres of clearcutting is anticipated in Compartment 45 before the end of the decade. It would provide the only regenerating age class in HMU 118 at the end of the decade.

### *Alternatives 2-4*

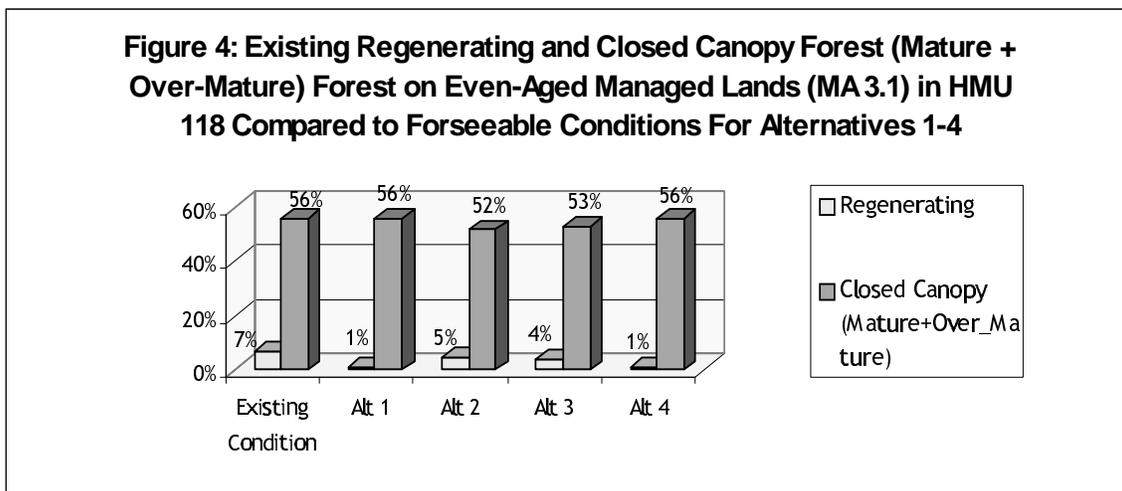
Treatments would be applied to compartment 44 to achieve Forest Plan objectives. Proportionately similar amounts of treatments are anticipated in Compartment 45. Both Alternatives 2 and 3 create a regenerating age class in the northern hardwood and spruce/fir types. Alternative 2 creates 4% more in northern hardwood and 1% more spruce/fir regenerating age class. Alternative 3 creates 3% more northern hardwood and 1% more

spruce/fir regenerating age class. Alternative 4 does not create any new regenerating age class.

The increase in the regenerating age class in Alternatives 2 and 3 also results in a decrease in the mature and/or over-mature age classes, depending on what stands are harvested. Because the northern hardwood stands available for regeneration are primarily in the mature age class, there is an overall decrease in the mature age class in both action alternatives. Alternative 2 has a 3% reduction in the mature northern hardwood age class. Alternative 3 has 4% reduction in the same mature age class.

If group selection treatments were continued in future management entries, there would eventually be a substantial increase in the spruce/fir type. In alternative 2, after 3 entries or about 60 years, an additional 123 acres or 14% of the project area would be converted. Alternative 3 would convert 144 acres or 16%. This would improve softwood acres within the HUM to 9% in alt 2 and 11% in alt 3. Alternative 4 would increase softwood in the project area to 18% and 11% in the HMU.

Overall, the lands in uneven-aged management and the mature and over-mature age classes on the lands in even-aged management provide a closed-canopy (mature/over-mature) forest. Currently, mature, closed-canopy forest exists on 56% of the MA/HMU cumulative effects area. Growth through the end of the decade would reduce the regenerating age class to 0% and closed canopy forest would remain at 56%. Regeneration treatments in Alternatives 2 and 3 would have the effect of reducing the closed-canopy forest in the cumulative effects area. A small amount of even and uneven age management is anticipated in compartment 45 in 2007, in the cumulative effects area beyond what is proposed in the Ramsey Basin project. If no natural disturbances create new regeneration, the maximum that closed-canopy forest could be reduced is 4% under Alternative 2. Figure 4, p. 40) displays the available regenerating age class and closed-canopy forest under existing conditions on management area 2.1 and 3.1 lands in HMU 118 compared to the closed-canopy forest available by alternative in the year 2014.



**Direct & Indirect Effects to Federal & State Listed & Other Plants of Concern:**

Tables 8 and 9, p. 41, summarize the effects determinations rendered in the Ramsey Basin BE/BA (in the project file) for Federally-listed TEPS plant species. See the Vegetation Report for a detailed analysis of potential effects to State-listed and other plants of concern.

The general effects of timber harvesting activities on vegetative diversity can be found in the Forest Plan FEIS, pp. IV-32 and IV-33.

**Table 8: BE/BA Effects Determinations for Federal TEPS Plants for the Ramsey Basin Project Area**

Federal Status	TEPS SPECIES	EFFECTS DETERMINATIONS
R9-Sensitive	Bailey's sedge ( <i>Carex baileyi</i> )	The proposed action and Alternative 3 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 Federally-listed Region 9 Sensitive plant species having low probability of occurrence within the Ramsey Basin Project Area.
R9-Sensitive	Clustered sedge ( <i>Carex cumulata</i> )	
R9-Sensitive	Squirrel-corn ( <i>Dicentra canadensis</i> )	
R9-Sensitive	Goldie's woodfern ( <i>Dryopteris goldiana</i> )	
R9-Sensitive	Broad-leaved twayblade ( <i>Listera convallarioides</i> )	
R9-Sensitive	Chilean sweet cicely ( <i>Osmorhiza berteroi</i> )	
R9-Sensitive	American ginseng ( <i>Panax quinquefolius</i> )	
R9-Sensitive	Nodding pogonia ( <i>Triphora trianthophora</i> )	

**Table 9: Effects Determinations for State Listed Plants Having A Very Low Probability Of Occurrence in the Project Area.**

Ciliated aster	Pale early violet	Large purple-fringed orchid		Alpine speedwell	<b>Alternatives 2 &amp; 3 would not adversely affect NH State-listed or other species of concern for the WMNF.</b>
Bosc's pigweed	Kidney-leaved violet	Large yellow lady's-slipper	Rock sandwort	Purple crowberry	
Squaw-root	Meadow horsetail	Walking-fern spleenwort	Flowering dogwood	Hound's tongue	
Jack pine		Large-spored quillwort	Trailing arbutus	Canadian germander	
Millet-grass	Pink lady's slipper	Green adder's-mouth		Dutchman's breeches	
Hidden sedge	White-fringed orchid	Small yellow lady's-slipper	Many leaved bulrush		

*Alternative 1 - No Action*

Understory shrubs and herbaceous vegetation would continue to grow, mature, and die under natural processes. Course woody material would be recruited onto the forest floor as trees die.

The No Action alternative would have no direct or indirect effects of trampling or compaction on the understory shrub or herbaceous vegetation within the project area due to no harvest activity.

*Alternative 2 - Proposed Action*

Direct Effects:

The potential direct effects to Federal TEPS and/or State TESSC and other plants of concern for the WMNF from single-tree, uneven-aged, or clearcut harvesting within the Ramsey Basin Project Area are anticipated to be overall relatively localized, minor to none respectively. All of the units are proposed for winter harvesting when snow and frozen ground conditions would minimize potential effects to understory vegetation. Also, wet areas, which some plants favor are routinely excluded from harvest units and skid trail layout.

Indirect Effects:

Potential indirect effects of Alternative 2 include increased or varied sunlight reaching the

forest floor from opening the canopy via harvest treatments, which could benefit shade intolerant plants such as R9-listed sensitive species clustered sedge that favors open woods and clearings, but would not benefit shade tolerant plants such as broad-leaved twayblade that favors deep shade.

There are no known documented occurrences of listed plant species within the harvest units of the project area.

Herbaceous plants in adjacent uncut stands would also be affected up to approximately 100 feet from the edge of the units proposed for clearcutting. The effects include changes in environmental gradients (i.e. heat, sunlight reaching the ground floor and moisture, and less competition from intolerant species) created by clearcutting, increased competition from intolerant species, or direct disturbance from harvesting activities.

Uneven-aged management can have less impact on herbaceous plant species than even-aged management. Single-tree and group selection harvesting can result in fewer changes in environmental gradients.

### *Alternative 3*

This alternative is similar to Alternative 2 except for two clearcuts (29 acres) that are changed to group selection. The effects discussed for group selection in Alternative 2 would be the same for Alternative 3, but would occur on more stand acres. The effects on the understory shrub and herbaceous vegetation would be nearly the same as Alternative 2 with slightly more group selection and less clearcutting.

### *Alternative 4*

This alternative has no even-aged management. Clearcutting and overstory removal proposed in Alternatives 2 and 3 and changed to group selection. There are no effects on herbaceous due to clearcutting. The effects of single-tree and group selection are the same but on more acres.

A substantial portion of the Ramsey Basin Project Area has not received any management in the past, and no management is proposed for the foreseeable future. These areas would continue to produce herbaceous vegetation in natural cycles.

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## **Summary of Effects to Federal and State-Listed & Other Plants Of Concern on the WMNF:**

Table 8, p.41, summarizes the effects determinations rendered in the Ramsey Basin BE/BA for federally-listed threatened, endangered, proposed and sensitive (TEPS) plant species (see the Ramsey Basin BE/BA in the Project File). The Vegetation Report discloses the analysis of potential effects to other plants of concern on the WMNF.

In Summary: There are no documented occurrences of federally- or state-listed or other plants of concern for the WMNF having a very low probability of occurrence within the Project Area (Tables 8 and 9, p. 41; Vegetation Report, Project File). Based on marginal amounts of suitable habitat present, the potential direct effects to listed plants include a low risk of trampling and/or soil compaction by machinery during summer or fall harvest operations. However, designated skid trails would minimize overall understory vegetation and soil disturbances during summer or fall harvest operations, and the majority of the stands are proposed for winter mitigation season of harvest when snow and frozen ground conditions would minimize potential effects to understory vegetation. Also, some of the State-listed and other plants of concern having low probability of occurrence within the Project Area favor wet areas that are excluded from harvest units and skid trail layout.

Indirect effects of the Proposed Action and Alternative 3 include increased sunlight reaching the forest floor from open canopy conditions via harvest treatments, which could be beneficial to shade intolerant plants that favor open woods and clearings, but negative benefit to the shade tolerant species that favor deep shade.

If listed plants were not discovered prior to project implementation, any of the action alternatives could cause some unavoidable impacts from management activities (USDA-FEIS 1986, IV 67-68). In general, the unavoidable impacts are most likely to correspond to the relative amounts of total acres treated (i.e. the greater the acres treated via clearcutting, the greater the potential to affect an undiscovered plant compared to less acres treated via single tree). These impacts would be minimized by winter harvesting mitigation proposed for most of the project area, which would shield the ground from soil compaction and disturbance. If additional listed plants are found during implementation, the Sale Administrator would alert the District Biologist and protective measures would be taken.

Since there are no documented occurrences and Standards and Guidelines would minimize potential effects, Alternatives 2-4 may impact individuals, but would not likely contribute to a trend towards listing or cause a loss of viability to the population or species of Federal or State-listed or other plants of concern on the WMNF having low probability of occurrence shown in the following table and in the Vegetation Report (Project File).

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### Cumulative Effects on Federal and State-listed and Other Vegetation of Concern

The analysis area for past, present and reasonably foreseeable future effects to federally- and state-listed and other plants of concern for the WMNF included the Ramsey Basin Project Area, and the forest-wide planning area to address population viability.

#### Alternative 1

The No Action Alternative would cause no direct effects of trampling vegetation or soil compaction in the project area due to no harvest activity, thus no cumulative effects to Federal or State listed or other plants of concern on the WMNF.

#### Alternatives 2, 3 & 4

The Proposed Action and Alternative 3 would cause relatively minor to no direct or indirect effects to listed vegetation resources, therefore there would be no cumulative effects.

### Terrestrial Wildlife Resources

**Issue 1 (p. 5):** The amount of clearcutting and overstory removal proposed in this project area will have a negative effect(s) on wildlife habitat, especially when added to the clearcutting that has occurred on adjacent public and private land (cumulative impact) (public, see p. 10).

**Measurement a:** The average early-successional habitat on MA 3.1 lands in HMU 118 provided during this decade (through 2014) compared to the desired composition for an “ideal” HMU in the Forest Plan (10%; LRMP, p. III-13).

**Measurement b:** The clearcutting/overstory removals in a cumulative effects area consisting of HMU 118 and an additional 1/2-mile of private land to the north and west of HMU 118

**Issue 2 (p. 6):** Lack of Long-term Softwood Component in HMU 118 (agency, see p. 10).

**Measurement 2b:** The predicted long-term effects on wildlife habitat diversity from a change in hardwood and spruce/fir habitat community in HMU 118.

The proposed Ramsey Basin Project Area is located in HMU 118 within Management Area 3.1 lands, which allow timber harvesting. Wildlife resource objectives for MA 3.1 lands are to provide a diversity of habitat types for a wide array of wildlife species with emphasis on early-successional species in MA 3.1 (USDA-LRMP 1986a, III-30, 36). Alternatives 1-4 of the Ramsey Basin Project respond to the purpose and need for greater wildlife habitat diversity to maintain wildlife populations (USDA-FEIS 1986, I-9) to varying degrees.

White Mountain National Forest Plan Management Indicator Species (MIS)

The Probability of Occurrence Analysis of WMNF MIS for the Ramsey Basin Project Area is located in the Ramsey Basin Project File. The occurrence of MIS and/or suitable habitat was based on but not limited to the following sources of information:

- Known documented occurrence or extirpation (NHNHI & USFWS lists / database).
- MIS life history & habitat needs (DeGraaf et al. 1992; DeGraaf & Yamasaki 2001).
- Site-specific, multi-seasonal & multi-year field surveys of the Project Area conducted during snow / snow-free and leaf on / off conditions (FS project record).
- Analysis of forest-wide wildlife monitoring data & monitoring reports (USDA-FS 1993, 1996, 1999, 2000a, 2001a).
- Analysis of the amount and quality of existing community types, age classes, and MAs present in the Ramsey Basin Project Area suitable for MIS (FS stand exam data, CDS database, HMU 118 analysis, field reviews & surveys).

**Ramsey Basin Project Area:** Table 10 shows 11 WMNF MIS have no probability of occurrence within the Project Area due to species extirpation and/or non-suitable habitat present. Suitable habitat is defined as meeting a species’ life history requirements such as food, cover, shelter, breeding, nesting, and young rearing (see Literature Cited). The “no occurrence” determination takes into account the potential for incidental or occasional travel through or fly-over of the Project Area.

**Table 10: MIS Species Having No Probability of Occurrence within the Ramsey Basin Project Area**

WMNF MIS	RATIONALE FOR NO OCCURRENCE
Eastern Towhee	Non-suitable habitat = no oak, regen/young age class in pine type.
Gray-cheeked (Bicknell’s) Thrush	Non-suitable habitat = no high elev. spruce / fir habitat or MAs 5,6,9.
Blackpoll Warbler	Non-suitable habitat = no high elev. spruce / fir or MAs 5,6,9.
Common Loon	Non-suitable habitat = no large bodies of water >10 ac supporting fish.
Osprey	Non-suitable habitat = no large bodies of water >10 ac supporting fish.
Gray Squirrel	Non-suitable habitat = no oak community type or MA 7.1.
Canada Lynx	Extirpated (USDI 1998, 2000). Addressed per CLCAS habitat S&Gs.
American Black Duck	Non-suitable habitat = Davis Brook headwaters too small.
Eastern Brook Trout	Non-suitable habitat = small headwaters in Project Area too shallow.
Sunapee Trout	Extirpated & non-suitable habitat = no deep coldwater bodies.
Robbins’ Cinquefoil	Non-suitable habitat = no alpine zone habitat within the Project Area.

Table 11, pp. 45-46, discloses that 14 WMNF MIS have the potential to occur within the Ramsey Basin Project Area and shows their population trend and viability within the forest-wide planning area (per 36 CFR 219.19(a)(6)). The Federally-listed threatened Canada lynx and Regional Forster-listed Sensitive Species (RFSS) peregrine falcon are also WMNF MIS.

**Table 11: MIS With Potential to Occur in the Ramsey Basin Project Area & Their Population Trends & Viability in the Forest-wide Planning Area ( per 36 CFR 219.19).**

Community / Community Type	MA	MIS	Forest-wide Population Trends & Viability Determinations (USDA-FS 2001a).
Northern Hardwood (includes spruce and swamp hardwoods) / <i>Regeneration</i>	3.1	Chestnut-sided warbler	Declining global population trends & in portions of Physiographic Area 28. 8 yrs of WMNF monitoring shows a decline that may continue with declining early-successional habitat. There is no danger of losing this warbler from the White Mountain Subsection in the near term & population viability is nationally & locally secure.
Northern Hardwood (includes spruce and swamp hardwoods) / <i>Mature and Over-mature</i>	2.1	Northern goshawk	Populations in Physiographic Area 28 stable with no indication of declines anywhere within their range. Population viability & distribution would be maintained under current WMNF practices.
Paper birch / Aspen <i>Mature and Over-mature</i>	2.1	Broad-winged hawk	Population trend on WMNF stable over 8-yr (1992-1999) with peak in 1994 & low in 1998. Forest-wide population is viable & well distributed.
Paper birch= <i>Regen/Young</i> Aspen = <i>All Ages</i>	3.1	Ruffed grouse	Population trends on WMNF fluctuated widely over 8-yr from 1992-1999, but their populations are viable statewide & on the WMNF in the near term.
Spruce / Fir <i>Regen &amp; Young</i>	3.1	Snowshoe hare	The local snowshoe hare population is viable & stable in the near term, with cyclic fluctuations.
Pine <i>Regen &amp; Young</i>	3.1	Northern (Dark eyed) junco	Population is viable and well distributed in the near term within the White Mountain Subsection (which includes the forest-wide planning area).
Spruce / Fir <i>Mature &amp; Over-mature</i>	2.1	Cape May warbler	Forest-wide WMNF monitoring data indicate a fluctuating population trend, but is considered viable within the forest planning area.
Pine <i>Mature &amp; Over-mature</i>	3.1	Pine warbler (intermixed pine)	Population viability on the WMNF is currently viable and stable.
Hemlock / <i>All ages</i>	3.1	White-tailed deer	Managed as game species and harvested annually, populations are viable in the near term with deer population trends fluctuating.
Upland Openings Community <i>Forest Ecotone - Grass, Forb, Apple</i>	3.1	Eastern kingbird	A declining population trend in Physiographic Area 28, yet ranked secure in NH & ME. Population is viable, yet White Mountain Subsection does not provide much openings suitable for kingbirds.
		Eastern bluebird	Stable population trend for Physiographic Area 28 from 1980-1999. Bluebirds have not yet reported during annual breeding bird surveys on the WMNF, probably due to lack of larger openings, yet is common in large openings off the WMNF. Local population marginally viable due to few large openings on the forest.

Based on HMU analysis, IDT and site-specific field surveys, literature and database reviews of species' habitat requirements and known documented occurrence, and personal communication with experts, 11 WMNF MIS have no likelihood of occurrence within Ramsey Basin Project Area due to extirpation and / or no suitable habitat present. See Appendices for Probability Of Occurrence Analysis of MIS for the Ramsey Basin Project Area. *Suitable habitat* = Meets life history requirements. *No occurrence* = includes occasional or incidental travel through or fly-over of the Project Area by some species.

**Table 11: MIS With Potential to Occur in the Ramsey Basin Project Area & Their Population Trends & Viability in the Forest-wide Planning Area ( per 36 CFR 219.19) cont.**

Community / Community Type	MA	MIS	Forest-wide Population Trends & Viability Determinations (USDA-FS 2001a).
<b>Upland Openings Community</b> <i>Forest Ecotone - Shrub</i>	3.1	Mourning warbler	Stable population trend in Physiographic Area 28 past 30 years. Forest-wide breeding bird data show significantly declining numbers in MAs 2.1 & 3.1, but clearcutting has declined on the WMNF. This warbler is ranked secure in all New England states & Canada. Local population is viable.
<b>Mixed Forest Type</b> <i>Varying age classes.</i>	All	American marten	Population on the Forest is believed increasing and not yet considered viable. See Project File.
<b>Wetlands and Water</b>		American black duck	Not expected to occur as Davis Brook headwaters too small and is addressed in the Aquatics Section.
<b>Permanent Waterbodies</b>		Eastern brook trout	Not expected to occur in Davis Brook headwaters and is addressed in the Aquatics Section.
<b>Cliffs and Talus</b>		Peregrine falcon	Increasing population trend in New England, but WMNF population not large enough to be viable.
<b>MA 5.1; 6.1 &amp; 6.2; 9.1</b>		Canada lynx	Extirpated but habitat present in Project Area.

Based on HMU analysis, IDT and site-specific field surveys, literature and database reviews of species' habitat requirements and known documented occurrence, and personal communication with experts, 11 WMNF MIS have no likelihood of occurrence within Ramsey Basin Project Area due to extirpation and / or no suitable habitat present. See Appendices for Probability Of Occurrence Analysis of MIS for the Ramsey Basin Project Area. *Suitable habitat* = Meets life history requirements. *No occurrence* = includes occasional or incidental travel through or fly-over of the Project Area by some species.

The USFWS lists the Canada lynx as extirpated from NH (USDI Federal Register 1998 and BO 2000). Due to the Standards and Guidelines for the protection of suitable habitat per the National Canada Lynx Conservation Assessment and Strategy, the potential effects to MIS Canada lynx are disclosed in the TEPS section of this analysis and the Ramsey Basin BE. The potential effects to the RFSS peregrine falcon and the State-listed threatened American marten and their population trends and viability are disclosed in the TEPS section of this EA and the Ramsey Basin BE. The MIS American black duck and MIS Eastern brook trout are discussed in the Aquatics Section.

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### Terrestrial Wildlife Affected Environment

The state of New Hampshire is predominately forested, which is steadily maturing as described in the Forest Statistics of New Hampshire: 1983-1997 (USDA, 2000a). The WMNF Forest Plan FEIS and the annual monitoring reports state there is abundant habitat for species that use mature or over-mature age classes. Based on current analysis of age classes and community types of the existing habitat conditions within HMU 118, there is a lack of regeneration age class and general lack of oak/pine, spruce/fir, paper birch, and aspen community types within the Ramsey Basin Project Area compared to Forest Plan desired condition. The Project Area is dominated by middle to older aged closed canopy habitat (Ramsey Basin Project File for HMU 118; forest-wide CDS analysis of forest type and age class). Of the songbird species on the Forest, approximately half are Neotropical migrants and more than half of these birds use early-successional habitats for all or part of their life cycle. There is a lack of regeneration-age habitat preferred by these species (USDA-LRMP 1986a, VII-B-2).

Site-Specific Ramsey Basin Project Area Field Surveys and Reviews:

Multi-year and multi-seasonal field surveys and reviews documented that the Ramsey Basin Project Area does not contain special, unique or exemplary communities such as old growth stands, mapped alpine bogs, ravines, meadows, high cliffs, rock talus slopes, vernal pools, caves, or mining tunnels (USDA-FS 2003, NHNHI-Bechtel 1998). None of the ecosystems or habitats affected by the No Action or action alternatives are scarce, unique, or regionally at risk. Forested wet areas are located outside the proposed harvest units. There are no known wetlands or vernal pools within proposed harvest units, landings, or along skid trails of the Ramsey Basin Project Area.

Old Growth Habitat:

The NHNHI database reviews and field surveys did not document any stands specifically identified as old growth within the Ramsey Basin Project Area (NHNHI-Bechtel 1998; FS-HMU Analysis Ramsey Basin Project File). MA 6.1 (located outside of and nearby the Ramsey Basin Project Area) provides a large, contiguous area of uneven-age, interior forest habitat. In addition, 10% of the management area 3.1 lands within HMU 118 are managed as an extended over-mature rotation component. Furthermore, approximately 435,000 acres (56% of the 780,000 acre WMNF) are designated in MAs 5.1, 6.1, 6.2, 6.3, 8.1, 9.1 and 9.2 that do not feature vegetation management across the WMNF forest-wide landscape. At the landscape level, this habitat is left to the natural process of forest succession for development of old-growth characteristics available to wildlife species that use features such as cavities, snags, downed large woody material, fungi, moss, lichens, and closed canopy with sparse under-story conditions.

In summary, the site-specific, multi-year and multi-seasonal plant and wildlife surveys confirmed the Ramsey Basin Project Area contains predominately northern hardwood forest and is lacking aspen and paper birch, spruce-fir, hemlock, and pine-oak communities. The hardwood forest typically provides habitat for general wildlife including but not limited to the species shown in Table 12. The Aquatic Section of this EA analyzed the potential direct, indirect, and cumulative effects to fish, amphibians, and reptiles.

**Table 12: General Wildlife Species Typically Associated with the Northern Hardwood Forest (DeGraaf et al. 1992).**

Large Mammals	Small Mammals	Songbirds/Hawks	Amphibians/Reptiles	Invertebrates
Moose White-tailed deer Black bear Coyote Fisher Fox	Woodland jumping mouse Masked & short-tail shrew Meadow vole Porcupine Chipmunk & Red squirrel Snowshoe hare Big and Little brown bat Eastern small footed bat Northern long-eared bat Mink, Skunk, Raccoon	Northern junco Black-capped chickadee Chestnut-sided warbler Cape May warbler Downy woodpecker Ruffed grouse Red-tailed hawk Broad-winged hawk Barred owl and Crow	N. dusky salamander Red spotted newt Wood and green frog Eastern garter snake American toad Wood turtle (See the Aquatics Functional Report)	Grasshopper Black fly Mosquito Deer tick Beetle sp. Butterfly & moth Earthworm Springtail

Multi-seasonal and multi-year field reviews documented the occurrence of several MIS within the Ramsey Basin Project Area. The FS also conducted winter track and small mammal trap monitoring during 1993-97 on the Ammonoosuc-Pemigewasset Ranger District within similar hardwood and softwood community types as found in HMU 118. The wildlife monitoring along the following transects detected occurrence of several MIS. These MIS are also expected to occur within the Ramsey Basin Project Area based on suitable habitat present.

- The Lost River & Walker Brook transects located east from the Ramsey Basin Project Area;
- The Pemigewasset Wilderness; North Fork; & East Branch transects (east of Project Area).

**Large Mammals (MIS white-tailed deer) (see also TEPS Section for Canada lynx):**

FS field reviews detected MIS white-tailed deer and moderate levels of existing deer use, such as winter fecal pellets, browsing pressure, bark scarred trees, and scattered game trails throughout the Ramsey Basin Project Area. The MIS white-tailed deer do occupy, use, and travel through the Ramsey Basin Project Area at various times of the year. In New England during severe winter conditions, the MIS white-tailed deer use dense softwood stands (often hemlock) as overwintering habitat (yard) and browse nearby hardwoods and softwoods adjacent to or within the concentrated softwoods (Reay et al. 1990).

Pre-project level monitoring of the Ramsey Basin Project Area included site-specific field reviews of the softwood component. Reviewers ensured the proposed prescriptions and the WMNF Forest Plan Standards and Guidelines would perpetuate this community type and habitat conditions necessary to support wintering populations of MIS white-tailed deer. Site-specific field reviews documented that the proposed harvest units of the Project Area contain several softwood stands. The softwood forest type within the Project Area does not function as core or primary deer (yard) overwintering habitat. There are no historic documented core overwintering deer yard(s) within the proposed harvest units of the Ramsey Basin Project Area (district records; personnel comm. with Karen Bordeau, NHFG Regional Biologist). NH Fish and Game manage MIS white-tailed deer as a game species harvested annually and their populations are considered viable in the state and on the forest, with MIS white-tailed deer trends fluctuating (NHFG 2003, USDA-FS 2001a).

The Ramsey Basin Project Area contains beech trees, which provide hard mast (beechnuts) and soft mast (buds) used by MIS white-tailed deer, MIS ruffed grouse, black bear, red squirrel, and wild turkey (Martin et al. 1961). Reviewers noted relatively few bear clawed and broken topped beech trees from foraging bears throughout the Project Area. Field reviews documented no large mammal denning sites such as bear dens within the units proposed for harvest. NH Fish & Game manages black bear as a game species that is harvested annually and populations are viable at 4,000 with increasing trends and well distributed in all counties including the WMNF (NHFG 2003).

**Small Mammals (MIS snowshoe hare) (see also TEPS Section for American marten):**

The Forest Service conducted winter track and small mammal trap monitoring during 1993-97 in hardwood and softwood community types on the wildlife transect lines described above. Species detected on the transect lines included fisher, fox, coyote, red squirrel, and common rodents such as mice, vole, and shrew (unpublished data). These species are expected to occur within the Ramsey Basin Project Area because the Project Area contains similar

habitat as the monitoring transects described above. Field review and surveys of the Ramsey Basin Project Area documented the occurrence of MIS snowshoe hare and the red squirrel. Although none were detected during the site-specific wildlife surveys, the MIS American marten could occur in the Project Area (Ramsey Basin Project File). Pre-project level monitoring of the Ramsey Basin Project Area included site-specific field reviews of the softwood component and review of the proposed prescriptions and Standards and Guidelines designed to perpetuate this community type and habitat conditions necessary to support populations of MIS snowshoe hare and MIS American marten. MIS snowshoe hare populations fluctuate widely over a period of several years, but their populations are viable statewide and on the WMNF. MIS American marten population trends are believed to be increasing on the forest (USDA-FS 2001a).

**Upland Game Birds (MIS ruffed grouse):**

The Forest Service field reviews and surveys documented the MIS ruffed grouse present in the Ramsey Basin Project Area. This analysis assumes wild turkey and American woodcock occur within the small forest openings and the mast producing areas as well. Pre-project level monitoring of the Project Area included site-specific field reviews of available habitat and review of the proposed prescriptions and S&Gs designed to create and/or perpetuate the community types necessary to support populations of MIS ruffed grouse. MIS ruffed grouse populations fluctuate widely over several years, but their populations are viable statewide and on the WMNF (USDA-FS 2001a).

**Neotropical Migratory Songbirds & Raptors (MIS Chestnut-sided, mourning, Cape May, & pine warbler; Northern junco; Eastern kingbird & bluebird; Northern goshawk & broad-winged hawk):**

Approximately half of the bird species on the White Mountain National Forest are Neotropical migratory songbirds that use early-successional habitat for part or all of their life cycle. The existing condition of vegetation in the Ramsey Basin Project Area provides nesting and/or foraging habitat for neotropical songbirds and hawks using mature or over-mature habitat. However, analysis of the vegetation composition of HMU 118 shows a shortage in the early-successional (0-9 year old) regeneration age class. Ongoing since 1992, the WMNF and NH Audubon monitor songbird and hawk populations on the forest-wide wildlife transect lines. Preliminary data from ongoing bird monitoring show a declining population trend of five Neotropical migratory bird species in the WMNF over the eight years (NHFG 2000a). All five species: the MIS chestnut-sided warbler, MIS mourning warbler, common yellowthroat, rose-breasted grosbeak and the veery, are dependant on early-successional habitat. The MIS mourning warblers show relatively stable population trends in the Physiographic Area 28 over the past 30 years. Forest-wide breeding bird survey data show significantly declining numbers in Management Areas 2.1 and 3.1 lands where active vegetation management is allowed, however, the amount of clearcutting on the WMNF has declined.

Forest Service Research biologists from the Northeastern Forest Experiment Station conducted directed searches across the WMNF for MIS Northern goshawk. As a result, Biologists found an active Northern goshawk nest approximately ¼ mile west outside of Unit 5 of the Ramsey Basin Project Area. (unpublished data, Costello 2003). Pre-project level monitoring of the Project Area included site-specific reviews of suitable raptor habitat. Reviewers ensured the Forest Plan Standards and Guidelines and proposed prescriptions were designed to provide the communities and habitat conditions necessary for maintaining MIS songbird and hawk populations.

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

The FS completed a site-specific Biological Evaluation (BE) of the potential effects of the No Action and action alternatives on Federally-listed Threatened, Endangered, and Proposed and Regional Forester-listed Sensitive Species (TEPS) and their habitat (USDA-FS Manual 2670). This EA summarizes the probability of occurrence of TEPS for the Ramsey Basin Project Area taken from the Ramsey Basin BE. The BE based the probability of occurrence of TEPS on suitable habitat present or known documented occurrence or species extirpation. Table 13 discloses the TEPS wildlife species having a very low to a medium probability of occurrence within the Ramsey Basin Project Area. These same species were also addressed in the forest-wide programmatic Biological Assessment of continued implementation of the 1986 WMNF Forest Plan (USDA-FS 1999)

**Table 13: TEPS Wildlife Species Having Probability of Occurrence Within The Ramsey Basin Project Area.**

STATUS	TEPS SPECIES	PROBABILITY OF OCCURRENCE
Endangered	Indiana bat ( <i>Myotis sodalis</i> )	Very low = summer roost/open forage area.
Threatened	Canada lynx ( <i>Lynx canadensis</i> )	Extirpated = suitable habitat is addressed*
R9-Sensitive	Peregrine falcon ( <i>Falco peregrinus anatum</i> )	Low = summer flyover/open forage areas.
R9-Sensitive	Eastern small-footed bat ( <i>Myotis leibii</i> )	Very low = summer forage in open areas.
R9-Sensitive	N. bog lemming ( <i>Synaptomys borealis sp.</i> )	Very low = riparian areas & softwood areas.
R9-Sensitive	Wood turtle ( <i>Clemmys insculpta</i> )	Very low = riparian areas and streams.

\*Canada lynx is addressed due to suitable habitat present per the CLCAS.

In summary, NHNHI database reviews and site-specific, multi-seasonal and multi-year field surveys of suitable habitat revealed no known documented occurrence of TEPS within the Project Area (NHNHI 2003 & 1998; FS field surveys 2003). The WMNF (including the Ramsey Basin Project Area) is not designated “critical habitat” by the USFWS in recovery plans for Eastern timber wolf, cougar, or Indiana bat. There is no proposed recovery plan for Canada lynx and no Federally-listed Proposed species for the WMNF. The Ramsey Basin BE determined that there are relatively medium to high amounts of human activity associated with the Project Area (i.e. dispersed campsites, hiking trails and trailhead parking lots; nearby towns of Boutin Corner and State Highway 118). The Ramsey Basin Project Area is considered non-suitable denning or rearing habitat for the extirpated species Canada lynx, Eastern timber wolf, and cougar. These large mammals have large home ranges, and the existing forested habitat within the project area is not a limiting factor in these species’ life history requirements. Although Canada lynx are extirpated, the Ramsey Basin BE addressed the CLCAS agreement. The bald eagle and peregrine falcon may flyover the general area, but do not nest within the Project Area (Foss 1994, Audubon 2003) and are not expected to establish nesting territories in the Ramsey Basin Project Area in the future.

Due to minimal amounts of potential suitable habitat within the Ramsey Basin Project Area, there is a very low probability of occurrence of RFSS Northern bog lemming and wood turtle. This EA summarizes the Ramsey Basin BE determinations of potential effects to Federally-listed TEPS for the Project Area.

**Other Species of Concern**

The WMNF conducted a Species Viability Evaluation (SVE) in 2002 of plant and animal species that are likely to occur on the WMNF whose viability (either within their entire range or only within the WMNF) is a concern now or in the next 20 years; or whose viability

might become a concern depending on factors that management of the WMNF could impact (USDA 2003). These species are referred to as “Species of Concern”, and Appendix G (located in the project file) discloses the probability of their occurrence within the Ramsey Basin Project Area.

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### **Terrestrial Wildlife Resources - Related Mitigation Measures**

In addition to the Forest and Management Area-wide Standards and Guidelines listed in the Forest Plan III-15, Appendix VII-B (including the WMNF Forest Plan TES amendment, USDA 2001), the following specific mitigation or coordination measures would be used under any action alternative.

- Retain mast producing beech trees heavily used by black bear unless a safety hazard, or located in regeneration units.
- Retain existing large downed woody material on the forest floor in proposed harvest units where feasible
- All action alternatives would retain snags per USFWS BO Terms & Conditions and Forest Plan TES Amendment for the protection of Indiana bat unless a safety hazard. If snags are felled, retain as large woody material on the ground
- All action alternatives are consistent with applicable standards and guidelines outlined in the Canada Lynx Conservation Assessment and Strategy for the maintenance of suitable lynx habitat
- All action alternatives would use non-invasive seed mix and straw mulch (where and when available) and as needed to prevent the introduction of invasive exotic plant species during revegetation closure work

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### **Environmental Consequences to Terrestrial Wildlife Resources**

#### **Potential Direct and Indirect Effects on Wildlife Resources**

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

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

This section summarizes the effects to MIS, and TEPS (taken from the Ramsey Basin BE), and discloses the potential effects to Other Species of Concern. Several MIS could occur within the Ramsey Basin Project Area and Table 14, p. 62-63, discloses a comparison of potential direct and indirect effects to the amount and quality of habitat available to MIS by alternative. Table 15, p. 64, discloses the cumulative effects on WMNF MIS population trends and viability in the forest-wide planning area.

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

Reconstruction of existing forest roads, reuse of skid trails or landings, woody vegetation removal, and noise from timber harvest activity would not occur in the Ramsey Basin Project

Area at this time. Routine maintenance of existing roads, wildlife openings, or fire suppression activities could occur in the area independent of vegetation management.

#### Direct Effects

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

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

The MIS northern goshawk (nest detected outside of harvest area during pre-project monitoring and multiple field reviews of the project area), and the MIS Cape May warbler (if present) would benefit from no change in the existing condition of the mature and over-mature, even-aged class of northern hardwoods and spruce/fir respectively. Forest interior species such as the ovenbird and wood thrush would also benefit from the perpetuation of the mature northern hardwood community type. Species preferring mature closed-canopy and climax forest conditions, such as the MIS broad-winged hawk and the MIS ruffed grouse representative of the mature/over-mature paper birch and aspen community respectively would benefit from the No Action alternative in the short term.

However, analysis of the HMU 118 (see Vegetation Report in Project File) indicates a need for creating a mixture of multiple age and size classes of trees in northern hardwood community type to meet the Forest Plan desired condition (DC) for habitat diversity. There is a disproportionate amount of habitat at the landscape level for species requiring regeneration age class, as adjacent private lands do not contribute substantially to this age class diversity. The No Action alternative does not meet the Purpose and Need and would not move the forest towards the DC for the regeneration age class in the northern hardwood, spruce/fir; nor paper birch community types; nor provide wildlife habitat diversity in managed lands identified in the Forest Plan (USDA-LRMP 1986a, III 30-35, III 35-41); nor meet the DC for HMU 118. The opportunity to create additional amounts of or perpetuate paper birch or aspen within the Project Area would not occur, and without a catastrophic natural event, these community types would decrease over time.

#### Indirect Effects

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

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

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

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

*Alternative 2 Proposed Action: (follows discussion of Alternative 3 on pp. 59)*

#### *Alternative 3 - Modified Proposed Action*

Trees would be felled via 40 clearcut, 23 overstory, and 88 singletree, and 28 group treatment acres (approximately 25% of the stand basal area with 1/5<sup>th</sup> acre size); totaling approximately 179 treatment acres. Approximately 1.6 miles of pre-haul road maintenance would occur along existing Forest Roads 145 and 146. Winter harvest only applies.

#### **Direct Effects**

Alternative 3 would cause the direct effect of displacing some wildlife species. In general, the timing of harvest would directly affect species differently (i.e. during breeding and young rearing and winter survival). Summer harvesting could affect arboreal and ground dwelling species that use trees for hiding cover, nesting, or foraging habitat. Fall harvesting could affect fewer arboreal or ground dwelling species, but could potentially affect species breeding and foraging on fall mast. Winter harvest potentially affects less ground dwelling species and may affect species using trees for winter dormancy habitat. Generally, species with home ranges larger than the proposed harvesting units could avoid the area during vegetation management activity.

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

No new road construction and relatively minor amounts of 1.6 miles of pre-haul road maintenance of the existing forest road system and old skid trails are proposed. Roads can cause direct effects to wildlife if they are barriers to travel routes for daily activities, dispersal, and migration. Forest roads and landings that remain open to the public can cause the direct effect of increased human access, which can cause the direct effect of wildlife mortality from road-kill, hunting and trapping, and cause adverse indirect effects on species intolerant of human activity (Deming 1994). BMPs (NHDFL 1997) and road closure Standards and Guidelines such as gates, berms, and rock barriers would limit motorized vehicle access within the project area upon completion of harvesting. Although hunting and human access can and should be regulated, it is an issue independent from silvicultural practices. The proposed road pre-haul maintenance and skid trail reuse under Alternative 3 would not create isolated habitat patches or restrict wildlife dispersal necessary for maintaining population viability. The WMNF FEIS analyzed the effects of road construction on wildlife, and Alternative 3 is within the range of effects (USDA-FEIS 1986, IV-27).

**Large Mammals** (*MIS White-tailed deer*) (see *TEPS* section for *MIS Canada lynx*): The white-tailed deer is a MIS for emphasis under the uneven-aged system in management area 3.1 (USDA-LRMP 1986a, VII-B-21, S&G #31). The availability of quality wintering areas for deer can be a limiting factor in their survival. Spruce-fir or hemlock stands are the basic cover component of most wintering areas. As a minimum, at least 50% of the entire wintering area should be in “functional shelter” at all times. Functional shelter is defined as softwood cover at least 35 feet tall, with at least 70% crown closure (Reay et al. 1990).

Site-specific field reviews determined the Project Area does not contain a known documented deeryard and the softwood areas within the stands proposed harvesting do not function as a core or primary yard habitat (FS and NHFG field reviews).

Alternative 3 would cause the direct effect of increased amount of limbs and tops on the ground from harvested trees, which would provide a localized, short-term source of natural browse for MIS white-tailed deer when they need it most for overwinter survival. Mobility patterns of large mammals traveling to, from, or within the proposed Ramsey Basin Project Area after harvesting activity would not be adversely affected by the proposed clearcut, overstory removal, and group selection treatments or any road reconstruction or skid trails. Skid trails and forest roads provide packed snow trails for animals such a bobcat, fisher, and coyote to move along while foraging. Large mammals such as moose and MIS white-tailed deer have large home ranges, and appear to adjust quickly to displacement from harvesting activity and may adjust their foraging behavior from day to night to avoid harvesting activity. Noise from logging equipment may cause a direct effect of displacing MIS white-tailed deer to other areas during the day, but they return at night to feed on down treetops. A moose was observed licking salt from harvesting equipment on an active logging operation on the White Mountain National Forest. On another forest, deer were observed browsing felled tree tops while forest workers continued operating nearby (personnel communication with Frank Hagan 2003). Alternative 3 would meet the Purpose and Need and would help move the forest towards the desired condition for HMU 118 and for managing the stands for hardwood regeneration for MIS white-tailed deer forage habitat (USDA-LRMP 1986a, VII-B-21, S&G #33).

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

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

The relatively moderate amount of potential ground disturbance within the Ramsey Basin Project Area (in terms of magnitude and duration) during winter frozen ground conditions associated with harvesting approximately 179 treatment acres could temporarily interrupt the established territories and travel patterns of some terrestrial small mammal species with small home ranges such as MIS snowshoe hare, mice, vole, or shrew. Temporarily displaced from their immediate territories by the direct effects of soil or snow compaction or tree removal, these species would most likely occupy immediately adjacent habitat. Once harvesting activity is completed, over time these species or their offspring may return to reestablish their former territories within the harvested units. Furthermore, the WMNF Forest Plan Wildlife Standards and Guidelines, mitigation measures, and the USFWS BO Terms and Conditions as amended to the Forest Plan would retain wildlife cavity trees, snags and existing large woody material already on the ground for habitat structure for MIS snowshoe hare and other small mammals.

Alternative 3 could displace individual MIS American marten seasonally from portions of its home range because of increased human presence during harvest activity (assuming the Project Area is part of a marten's home range). Forest-wide wildlife monitoring data indicates marten are distributed across the northern portion of the WMNF suggests their populations are increasing (USDA-FS 2001a).

**Upland Game Birds (*MIS ruffed grouse*):** Alternative 3 would have the direct effect of creating open forage habitat for MIS ruffed grouse. The ruffed grouse requires early-successional young age-class, as grouse often nest in regenerating stands created through clearcutting. The dense cover in young stands may afford grouse protection from nest predators. Ruffed grouse nests located in dense shrub growth of 4-year-old clearcuts were found to be least susceptible to predation by crows and blue jays in central Pennsylvania (Yahner and Cypher 1987 in Harlow et al. 1997).

**Neotropical Migratory Songbirds & Raptors (*MIS Chestnut-sided, mourning, Cape May & pine warbler; Northern junco; Eastern kingbird & bluebird; Northern goshawk & broad-winged hawk*):** A direct effect of tree removal via clearcutting, overstory removal, and group selection treatments may cause displacement from upper canopy habitat of various neotropical birds and hawks. Other suitable upper canopy habitat would be available to these species in the large blocks of mature closed canopy forest within the HMU 118 that are not subject to vegetation management. This mature habitat would remain long-term sources of closed-canopy habitat within the HMU. The tree containing the goshawk nest discovered during field review would not be harvested under the action alternatives, and a ¼-acre reserve group of trees would remain around any raptor nest site (NHDFL 1997). No harvesting activity would occur from March 15 through May 20 to avoid conflict with active raptor nests (USDA-LRMP 1986a S&G, III 18 & VII-B-20). The winter harvest mitigation measures proposed under Alternative 3 would avoid the direct effects of disturbance to songbird nests or eggs. The Proposed Action would not have a measurable negative effect on migratory bird populations hence the project complies with the Migratory Bird Treaty Act Executive Order 13186 and MOU. The 1918 MBTA was designed to forestall hunting of migratory birds and the sale of their parts, and was not intended to regulate timber harvesting.

## Indirect Effects

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

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

**Large Mammals** (*MIS White-tailed deer*) (*see TEPS section for MIS Canada lynx*): Alternative 3 would cause an indirect effect of stimulating the softwood regeneration and growth, and increasing the hardwood browse beneficial to MIS white-tailed deer. Most studies indicate that the first few years after clearcutting, deer and moose foods (succulent stems of woody plants, forbs, and grasses) increase to their highest level of abundance and availability (Martin et al. 1955, Murphy and Ehrenreich 1965, Crawford et al. 1975, Smeins and Hinton 1987 cited in Harlow et al. 1997). Clearcuts have been found to enhance deer habitat in most regions, even in the snowbelt portions of the north central and northeast states, providing that nearby shelter against cold winter winds is available (Verme 1965, Krefting and Phillips 1970, Newton et al. 1989, Hughes and Fahey 1991 cited in Harlow et al. 1997). The forest openings created by group and clearcutting treatments under Alternative 3 would increase browse for MIS white-tailed deer and moose. These native wildlife species inhabit a wide range of forest types and age classes in the northern hardwood forests. The amount of understory ground vegetation and reserve trees within the harvested stand after treatment, coupled with the surrounding uncut forest, would provide adequate food, shelter, and escape/hiding cover for wildlife species (Gore 1988, cited in Deming 1994).

Alternative 3 would have the indirect effect of residual hardwood stumps sprouts providing browse for MIS white-tailed deer. The group selection treatments would benefit black bear habitat via an increase of herbaceous and berry producing shrubs in the open areas after harvest treatments. Some individual mast producing beech trees would be cut during harvesting. However, mitigation measures would retain heavily used concentrations of beech trees scarred by foraging black bear (*see mitigation measures*). A review of stand data (district files) indicates that several northern hardwood stands within the HMU 118 contain beech trees with sufficient size to produce beechnut mast. The relevant studies cited above support the reasonable conclusion that the harvest treatments proposed for the Project Area would produce suitable habitat for moose, black bear, and MIS white-tailed deer.

**Small Mammals** (*MIS Snowshoe hare*) (*see TEPS section for MIS American marten*): Under Alternative 3, Forest Plan Riparian and Wildlife Standards and Guidelines (USDA-LRMP 1986a, III 15-19) would maintain existing and future wildlife cavity and snag trees and downed large woody material located within and immediately adjacent to the proposed harvest units, which would mitigate potential effects of tree removal. Maintaining this habitat diversity is beneficial to MIS snowshoe hare, MIS American marten, small rodents, forest bats, birds, amphibians, reptiles, and invertebrates as potential roost, nesting, or forage

habitat (Tubbs et al. 1987). In addition, more than 10% of HMU 118 is managed under an extended rotation providing older trees as potential roosting and nesting habitat for forest bats, birds, and small mammals. The adjacent forest and the Pemigewasset Wilderness (located approximately 10 miles east of the Project Area) would also provide habitat available to MIS snowshoe hare, MIS American marten, forest bat, bird, and small mammal at the landscape level. The potential beneficial indirect effects of increased sunlight for solar warmth in the treated stands and of increased foraging areas in clearcuts and group selections could reduce or off-set any potential direct effects of tree removal on MIS snowshoe hare, MIS American marten, forest bats, birds, or small mammals.

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

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

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

**Upland Game Birds (*MIS ruffed grouse*):** Under Alternative 3, clearcutting would increase the percentage of early-successional habitat for the MIS ruffed grouse. Gullion (1990) found one-acre clearcuts with good aspen regeneration have provided the highest response/acre cut. By contrast, of 32 clearcuts less than one-acre in size made at the same time, breeding grouse used only five; suggesting one-acre size threshold that must be reached or exceeded before a clearcut would become an acceptable covert for ruffed grouse winter and breeding season use. Designated landings, skid roads and trails, and Riparian Standards and Guidelines (USDA-LRMP 1986a, III 15-16) would protect and maintain habitat important to invertebrates as prey base for MIS grouse and other birds such as the American woodcock.

**Neotropical Migratory Songbirds & Raptors (*MIS Chestnut-sided, mourning, Cape May & pine warbler; Northern junco; Eastern kingbird & bluebird; Northern goshawk & broad-winged hawk*):** Alternative 3 would have the indirect effect of increasing open forage areas through the group selection and clearcutting treatments beneficial to MIS songbirds and hawks. Neotropical migratory bird research on the WMNF (Costello 1995) indicated that clearcutting provides more opportunity than group selection for bird species that require early-successional habitat to fulfill all or part of their breeding requirements. Clearcut

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

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

**Forest Fragmentation and Edge Effect:** Alternative 3 would create short-term, localized edge habitat along the boundaries of the units proposed for clearcutting and group selection treatments until the vegetation attained vertical height. Vegetation age-class or type conversion within a heavily forested landscape such as the White Mountain National Forest is usually not considered forest fragmentation.

Forest-interior (edge-avoiding) birds are vulnerable to brood parasitism by the brown headed cowbird and predation by blue jays, raccoons and red squirrels, particularly in forests fragmented with agricultural land with pasture used by cattle. A study by DeGraaf and Angelstam (1993) on depredation on artificial ground and cup nests in even-aged seedling/sapling, pole, and mature stands of northern hardwood forest in the White Mountain National Forest found no increase in the nest predation rate in the early stages of stand growth, nor was rate of predation related to stand area. Another study in the same forest type compared predation rates in large blocks of managed areas vs. remote reserved areas. No differences in nest predation rates were found for either ground or shrub nests between the even-aged clearcut regenerated areas and the reserved forest blocks (DeGraaf 1995).

On the WMNF, the first two years of ongoing forest wide bird monitoring detected six cowbirds during point counts within managed, un-managed, and remote areas (Committee of Scientist wording) and during wetland inventories. Conversely, forest interior ovenbirds were found over 90 percent of the point count plots (USDA-FS 1993, Monitoring Report).

Recent studies on the WMNF show no increase in brown-headed cowbirds (Yamasaki et al. 2000). Based on Breeding Bird Surveys (1966-98), species showing large or significant population declines within the Partners In Flight Physiographic Area 28 (including the WMNF) show declining trends for the brown-headed cowbird (Rosenberg and Hodgman 2000).

Since occurrence of cowbird and elevated predation rates are usually interpreted as an indication of fragmentation of the forest, the results of these studies and White Mountain National Forest bird monitoring suggest that hardwood-dominated forests in northern New England are not fragmented by even-aged management. Ovenbird habitat use and reproductive success were examined in northern NH to determine the effect of edge in predominately-forested landscapes. The proportion of nests that failed from all causes, including predation, was higher along edges in 1992 but not in 1993. The number of young fledged per female and the proportion of pairs fledging at least one young did not differ between edge and interior in either year. This study concluded that the effects of clearcutting are moderated by the abundance of mature forest cover in the region and by the tendency of ovenbirds to re-nest after initial nest failure (King et al. 1995 cited in Harlow et al. 1997). These local studies suggest that in large forest tracts like the WMNF, applying a mix of both methods would cause no adverse effects to songbirds.

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

#### *Alternative 2:*

This alternative would treat the same stands as Alternative 3. However, under Alternative 2, trees would be felled via 69 clearcut, 23 overstory, 88 singletree, and 21 group treatment acres (approximately 25% of the stand basal area with 1/5<sup>th</sup> acre size); totaling approximately 201 treatment acres. Approximately 1.6 miles of pre-haul road maintenance would occur along existing Forest roads 145 and 146. Winter mitigation measures described under Alternative 3 would apply.

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

This alternative would have similar direct and indirect effects on wildlife or their habitat as described under Alternative 3. However, MIS that use the regeneration age class of the northern hardwood community type would find a greater amount of this habitat available within the Project Area. The greater amount of clearcut acres would provide suitable habitat to these MIS and to forest bats foraging in canopy gaps from the clearcut and group selection treatments. Single-tree selection treatments would not initiate softwood regeneration or conversion to this habitat type, but would maintain similar amounts of mature forest hardwood habitat for MIS broad-winged hawk and the ovenbird.

Alternative 2 would provide more early-successional habitat suitable for MIS songbirds, grouse, white-tailed deer, and moose and black bear compared to Alternative 3, as

approximately 10% of native forest wildlife species use mature or over-mature forest stands (USDA-LRMP 1986a, VII-M-6, IV-43). The MIS chestnut-sided and mourning warblers nest and feed in clearcuts. Some species would benefit from the combination of mature and regenerating forest conditions that would be created with clearcut and group selection and single-tree treatments. Alternative 2 has the greater potential to move the forest towards the DFC for diverse early-successional habitat for wildlife needs compared to Alternative 3.

*Alternative 4:*

This alternative would treat the same stands as Alternatives 3 and 2. Under Alternative 4, trees would be felled via 0 clearcut, 0 overstory, 86 singletree, and 44 group treatment acres (approximately 25% of the stand basal area with 1/5<sup>th</sup> acre size); totaling approximately 122 treatment acres. Approximately 1.6 miles of pre-haul road maintenance would occur along existing Forest Roads 145 and 146. Winter mitigation measures described under Alternative 3 would apply. This action alternative would provide the least amount of early successional habitat and lesser potential to move the forest towards the DF for diverse habitat for wildlife.

*Potential Effects on the Amount and Quality of Habitat for MIS*

A recent query of the WMNF database generated the approximate total acres of forest type by age class within the forest-wide planning area. The acres of forest type by age class were combined into the community/community type each MIS represents per Forest Plan Wildlife Strategy (USDA-FS 1986a, VII-V-B- 5-16), resulting in the amount (acres) and quality (age class and type) of potential suitable habitat available within the forest-wide planning area for each MIS (CDS analysis USDA-FS 2003). Table 18 discloses that the No Action and the action alternatives would affect the amount and quality of habitat differently for MIS having probability of occurrence within the Ramsey Basin Project Area. Some species such as the MIS Eastern kingbird and bluebird would benefit from the immediate establishment of open areas and young trees under the action alternatives, while other species such as the MIS Northern goshawk would benefit in the long term through the perpetuation of shade intolerant forest community types such as paper birch. Species that use large areas of mature forest such as the MIS Cape May warbler would benefit from the No Action alternative. All of the other MIS are either negligibly affected by or derive benefit from the treatments which utilize even-age management, namely the Alternatives 2 and 3. The effects to wildlife and habitat are within the range of those described in the FEIS (USDA 1986, IV-62).

The analysis of effects to the amount and quality of habitat for WMNF MIS peregrine falcon and Canada lynx taken from the Ramsey Basin BE are disclosed in the TEPS Section. The potential effects to the amount and quality of habitat for WMNF MIS American black duck and Eastern brook trout are disclosed in the Aquatics Section. The WMNF MIS rufous-sided (now Eastern) towhee, grey-cheeked (now Bicknell's) thrush, blackpoll warbler, common loon, osprey, gray squirrel, Sunapee trout, and Robbins' cinquefoil are not shown in Table 18 due to no probability of occurrence in the Project Area based on extirpation and/or non-suitable habitat present (Ramsey Basin Project File).

*MIS Population Trends & Viability within Forest-wide Planning Area:*

Based on the potential direct, indirect, and cumulative effects addressed in this EA, Table 19 discloses that the No Action alternative would add to a declining amount of early-successional habitat (suitable to a greater number of MIS) within the Ramsey Basin Project Area. However, the No Action alternative in the near term **would not adversely affect population trends and viability of WMNF MIS within the forest-wide planning area.**

Table 14: Effects on the Amount and Quality of Habitat by Alternative for MIS Having Probability of Occurrence Ramsey Basin Project Area (per 36 CFR 219.19).

MIS	Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3 (Modified Proposed Action)	(Uneven)
American Marten Mixed forest. Varying age class.	Perpetuates the lack of age class diversity. Long-term loss of paper birch. Increase in softwood type via long-term forest succession.	Increase in age class diversity via 69 CC; 23 Overstory; 88 Single-tree; 21 Group acres. Perpetuates paper birch & potential softwood forest type within the groups.	Increase in age class diversity via 40 CC & 23 Overstory; 88 Single-tree; 28 Group treatment acres. Softwood development in the groups as Alt. 2.	Least increase in age class diversity via 0 CC, C tree; 44 G compared
Snowshoe Hare Spruce / fir = Regen / young.	Perpetuates lack of regen / young age classes. Potential increase in softwood type over the long-term.	Increase in regen / young age classes as forage via 69 CC acres with increase in spruce/fir regen via small groups.	Increase in regen / young age classes via 40 CC with spruce/fir regen via 28 acres of small groups.	Least increase in age class: spruce/fir
Cape May Warbler Spruce / fir. Mature / over-mature.	Maintains mature closed canopy forest conditions. Potential increase in softwood type over the long term.	Conversion of mature closed canopy forest into open canopy and young age class via 69 CC; and 21 group treatment acres, but very little is in the softwood type.	Similar conversion of mature closed canopy forest into open canopy conditions via 40 CC & 23 Overstory; 28 group treatment acres.	Least conversion for canopy for and young group acre the softwood
Chestnut-sided Warbler N. hardwood. / Regen / young	Perpetuates the lack of openings & regen / young age classes in northern hardwood forest.	Increase in regen / young age class in northern hardwood type and increase in opening habitat via 69 CC; and 21 group ac.	Increase in regen / young age classes in hardwood type via 40 CC & 23 Overstory; & 28 group treatment acres.	Least increase in age class type or increase via 0 CC; &
Northern Goshawk N. hardwood. Mature / over-mature.	Maintains mature closed canopy forest for nest habitat. Lack of openings & long-term loss of paper birch.	Conversion of mature forest w/ reduced potential nest habitat via 69 CC; 23 overstory; 21 Group acres. Perpetuates paper birch & increases open habitat.	Conversion of mature forest into open habitat via 40 CC; 23 overstory; & 28 group ac. Perpetuation of paper birch & increased open habitat.	Least conversion into open habitat: 86 single tree acres. Lea birch.

Table 14: Effects on the Amount and Quality of Habitat by Alternative for MIS Having Probability of Occurrence in the Ramsey 36 CFR 219.19) cont.

MIS	Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3 (Modified Proposed Action))	(Uneven
Ruffed Grouse P. birch = <i>Regen / young.</i> Aspen. <i>Mature/over-mature.</i>	Perpetuates existing lack of regeneration age classes. Long-term loss of aspen and paper birch components.	Increase in regen / young age class in hardwoods via 69 CC; and 21 group acres. Perpetuation of aspen & paper birch via greater amount CC openings.	Less increase in regen / young age class via 40 CC; 23 Overstory; & 28 group acres with lesser perpetuation of aspen & paper birch compared to Alt. 2.	Less increase in class via 0 treatment perpetuation birch compared
White-tailed Deer Hemlock = <i>All ages</i>	Perpetuates lack of regen / young age classes as future forage habitat. Maintains hemlock.	Increase in regen / young age classes in hardwoods as forage in openings via 69 CC & 21 group acres. Maintains hemlock.	Less increase in regen / young age classes via 40 CC; 23 Overstory; & 28 group acres as Alt. 2. Maintains hemlock.	Less increase in classes via compared hemlock.
Eastern Kingbird Openings	Perpetuates existing lack of opening habitat.	Increase in l openings via 69 CC; & 21 group treatment acres and associated landings.	Less increase in openings via 40 CC; 22 Overstory; 28 group; & 88 single tree ac.	Least increase in CC; 44 group acres.
Eastern Bluebird / Openings	Similar as described for Kingbird.	Similar effects as described for Kingbird.	Similar effects as described for Kingbird.	Similar as
Mourning Warbler/Openings	Similar as described for Kingbird.	Similar effects as described for Kingbird.	Similar effects as described for Kingbird.	Similar as
N. (dark eyed) Junco	Perpetuates lack of regen / young age classes. Potential increase in softwood type over the long term.	Increase in regen / young age classes with potential for some pine regen via 69 CC; and 21 group treatment acres.	Less increase in regen / young age classes with some pine regen via 40 CC; 23 Overstory; and 28 group; 88 single tree acres compared to Alt. 2.	Least increase in age class due to 0 C tree acres
Pine = <i>Regen / young</i>	Maintains mature closed canopy forest conditions (few pine present). Potential increase in softwood type over long-term.	Similar conversion of mature forest as Cape May Warbler, but very little mature / over-mature pine present. Potential for pine regen in clearcuts and groups.	Similar effects as Cape May Warbler, but very little mature or over-mature pine type present in the Project Area.	Similar effect over-mature the Ramsey

Table 15: Effects To MIS Having Probability Of Occurrence in The Ramsey Basin Project Area

MIS HAVING PROBABILITY OF OCCURRENCE IN THE PROJECT AREA	EFFECTS DETERMINATIONS FOR THE NO ACTION	EFFECTS DETERMINATIONS FOR THE ACTION ALTERNATIVES
<p>Northern Junco <i>Junco hyemalis</i>                      Cape May Warbler <i>Dendroica tigrina</i>                      Pine Warbler <i>Dendroica pinus</i>                      Mourning Warbler <i>Oporornis philadelphia</i>                      Chestnut-sided Warbler <i>D. pensylvanica</i>                      Eastern Kingbird <i>Tyrannus tyrannus</i>                      Eastern Bluebird <i>Sialia sialis</i>                      Ruffed Grouse <i>Bonasa umbellus</i>                      Northern Goshawk <i>Accipiter gentilis</i>                      Broad-winged Hawk <i>Buteo platyterus</i>                      White-tailed Deer <i>Odocoileus virginianus</i>                      Snowshoe Hare <i>Lepus americanus</i>                      American Marten <i>Martes Americana</i>                      Peregrine Falcon <i>Falco peregrinus anatum</i>                      Canada Lynx <i>Lynx canadensis</i> (extirpated)</p>	<p>The No Action alternative would add to the declining amount of early-successional habitat within the Project Area. Over time, a declining trend of MIS that use this habitat type would occur within the Ramsey Basin Project Area.</p> <p>However, the No Action (in the near term) <u>would not adversely affect population trends and viability of WMNF MIS within the forest-wide planning area.</u></p>	<p>The action alternatives would decrease the amount of mature and over-mature habitat and inversely increase the amount of early-successional habitat by a varying number of acres within the Ramsey Basin Project Area.</p> <p>However, the action alternatives <u>would not adversely affect the population trends and viability of WMNF MIS within the forest-wide planning area.</u></p>

See Aquatics Section for effects and viability determinations for MIS American black duck and Eastern brook trout.  
 See Project Pile for complete analysis of effects for MIS American marten.  
 See TEPS Section Table 8 and Ramsey Basin BE for further analysis of MIS Peregrine falcon and MIS Canada lynx.  
 Although extirpated, Canada lynx is addressed due to potential suitable habitat present within the Ramsey Basin Project Area.

The Modified Proposed Action and other action alternatives would reduce the amount of mature and over-mature habitat (suitable to a lesser number of MIS) and inversely increase the amount of early-successional habitat within the Project Area. However, The Modified Proposed Action and other action alternatives **would not adversely affect population trends and viability of WMNF MIS within the forest-wide planning area** (see the WMNF PVA USDA-FS 2001a in the Ramsey Basin Project File)

**Cumulative Effects on Terrestrial Wildlife Resources**

The HMU 118 was used as the cumulative effects analysis area to facilitate evaluation of past, present, and reasonable foreseeable future effects on wildlife resources. The temporal scope is 10 years (period of time between HMU reevaluation for 0-9 yr. age class). The HMU 118 includes the habitat needs of large mammal MIS with wide home ranges and evaluation of habitat distribution (Vegetation Report). Because the home range and habitat needs of wildlife vary by species (DeGraaf et al. 1992), the HMU 118 also includes the smaller site-specific Ramsey Basin Project Area that contains the home range of small mammal MIS, amphibians, and reptiles. The TEPS section of this EA also used the broader WMNF landscape and regional analysis scales to assess potential cumulative effects to habitat distribution and connectivity with respect to wildlife population trends and viability within the forest-wide planning area (36 CFR 219.19).

*Alternative 1 (No Action)*

This alternative would add an adverse cumulative effect to the steadily declining trend in types within the Project Area and at the larger HMU 118, Forest-wide, and New England regional scales. Because of a decline in early-successional habitat, Neotropical migrant MIS chestnut-sided and mourning warblers and snowshoe hare, and upland opening MIS

Eastern kingbird and MIS bluebird that rely on early-successional age class and/or aspen/birch community type would potentially decline within the Ramsey Basin Project Area. Overall, wildlife habitat and species biodiversity within the Ramsey Basin Project Area would decline (NHFG 1996). At the landscape scale, this alternative would add to the cumulative effects of a maturing forest, which is steadily increasing over the past several decades across the White Mountain National Forest, as well as across New England forested landscapes (USDA-FS 1993).

#### *Alternatives 2-4*

The active Boutin Corner Sale is located about 1/4 mile north of the Project Area in HMU 117. Harvesting is expected to be completed during the winter of 2003-4. The recent Titus Brook II Timber Sale is located southwest of the Project Area in the same HMU 118 as the Ramsey Basin Project, and harvesting was completed in January 2004. Recent harvesting within the Boutin Corners and Titus Brook II Project Areas showed no evidence of major erosion, insect infestation, or disease during sale administration. The recent EAs completed for these Timber Sales determined little to no cumulative effects to wildlife resource from implementation of any of the action alternatives. The most recent site-specific NEPA decision made in the Project Area was Davis Brook (1984). There are no other vegetation management projects anticipated in the Ramsey Basin Project Area within the foreseeable future (2016). Within the next five years, a project is anticipated in Compartment 45, south of the Ramsey Basin Project Area and also in HMU 118. Past NEPA decisions involving vegetation management in the vicinity have not contributed substantially to the age class diversity within the cumulative effects area or nearby due to relatively small amount of acres treated. Stands treated in the Boutin and Titus II Timber Sales will grow out of the early successional stage into the next age class in approximately 9 years. These areas would no longer provide early successional habitat for wildlife species. The early successional age class habitat is declining in HMU 118 and on the WMNF landscape and New England region over the past several decades (USDA-FS 1993).

Future non-Forest Service actions on private land adjacent to the forest and HMU 118 are not expected to create substantial amounts of large opening or early successional habitat used by wildlife. No additional Forest Service vegetation management projects are expected within the Ramsey Basin Project Area or HMU 118 in the reasonably foreseeable future. Any Forest Service non-vegetation management projects within the cumulative effects area would contain a similar mix of wildlife standards and guidelines as described for the Ramsey Basin Project.

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

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

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

In summary, there are no known documented occurrences of TEPS wildlife species within the Ramsey Basin Project Area. The potential effects to TEPS wildlife species include the

same direct, indirect, and cumulative effects previously described under the terrestrial wildlife resource section. Table 20 discloses the effects determinations for Federally-listed TEPS wildlife species and their habitat taken from the Ramsey Basin Project BE (see the Project File).

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

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

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

The No Action and all action alternatives of the proposed Ramsey Basin Project would cause no adverse effects to the other species of concern or their suitable habitat shown in Appendix G. All of the stands in the Project Area would be harvested during winter months when these species are dormant and/or a relatively small amount of suitable habitat would be affected. Also, the action alternatives would either create and/or perpetuate suitable habitat for these species.

#### *Cumulative Effects:*

The analysis area for assessing potential cumulative effects to TEPS species taken from the Ramsey Basin BE included site-specific Ramsey Basin Project Area (small home range) and the broader WMNF landscape and Lynx Assessment Unit 13. The Partners In Flight Physiographic Area 28, and the New England and White Mountain subsection regional scales were also used to assess cumulative effects to TEPS and other species of concern population viability. The temporal scope varied to include the past 3 yrs to future 10 years (when USFWS T&C implemented and HMUs reevaluated).

**The Ramsey Basin BE considered the effects determinations from past BEs completed for the recent Sales mentioned above (located near the Ramsey Basin Project Area). The USFWS concurred with the Ramsey Basin BE findings of no adverse cumulative effects from past, present, and reasonably foreseeable projects (including the Ramsey Basin Project) (See Table 16, p. 66).**

#### **Aquatic Resources**

No Unresolved Issues Related to Aquatic Resources

Table 16: Effects Determinations Taken from the Ramsey Basin BE.

FEDERAL STATUS	TEPS WITH POTENTIAL OCCURRENCE WITHIN THE PROJECT AREA	RAMSEY BASIN BE EFFECTS DETERMINATIONS
Threatened Threatened	Canada lynx ( <i>Lynx canadensis</i> ) *	no effect to the Federally-listed threatened Canada lynx. All alternatives meet the S&Gs outlined in the CLCAS for protecting suitable lynx habitat.  * Although extirpated, the Canada lynx is addressed due to the CLCAS and suitable habitat present.
Endangered	Indiana bat ( <i>Myotis sodalis</i> )	may affect, but are not likely to adversely affect Federally-listed Endangered Indiana bat. All alternatives meet the T&Cs outlined in the BO (USDI 2000) as amended to the FP.
R9-SS R9-SS R9-SS R9-SS	Peregrine falcon ( <i>Falco peregrinus anatum</i> ) Eastern small-footed bat ( <i>Myotis leibii</i> ) N. bog lemming ( <i>Synaptomys borealis sp.</i> ) Wood turtle ( <i>Clemmys insculpta</i> )	no impact to peregrine falcon, and 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 myotis, Northern bog lemming, or wood turtle.

**Forest Plan Management Area Direction:**

The desired conditions for aquatic resources in MAs 2.1 and 3.1 land are to provide an array of habitat types and meet Forest Plan Standards and Guidelines (USDA-LRMP 1986a, III 15 a-d, 16, 19, 20 as amended, III-48) which allows stocking of indigenous fish species in MAs 2.1, 3.1, and 6.1.

**Riparian Management Direction:**

Riparian and fish habitat management direction provides for the protection of water quality and stream bank stability and enhancement of floodplain, wetland, and riparian area functioning to support associated biotic communities (USDA-LRMP 1986a, III-15d, 19, as amended). Table xx displays the minimum width of the riparian areas along with the riparian channel types within the Ramsey Basin Project Area. The intermittent headwater portion of Davis Brook within the Ramsey Basin Project Area is Type12 and the beaver pond near Unit 45 is Type 35.

Table 17: White Mountain National Forest Riparian Classification System Types & Minimum Buffer Widths.

Riparian Type	Minimum Riparian Area Width
<b>Type 12:</b> Channels are steep (4 to 10 % slope) found in narrow flat-floored valleys. Type 12 channels have a high channel capacity but will experience annual floods at some low areas on bends. There are minor amounts of deposition, but generally, the normal bedload is carried through the reach. Type 12 is highly stable and has the lowest hazard for road crossings.	Valley inner-gorge or 50 ft + (4 x % slope)
<b>Type 35:</b> Alluvial swamp usually maintained by beaver. Channel functions as a filter, slowing the water and removing sediment and organic particles.	Site by site basis.

Riparian Areas (RA): RA width will be based on site conditions (channel stability, topography, flood potential) and/or the riparian type. The Ramsey Basin Project Area includes these riparian types. Specific protection measures will be prescribed on a site-by site basis for intermittent or ephemeral streams (LRMP 1986a, III-19, VII-E-1).

### Management Indicator Species (MIS)

**American black duck** (*Anas rubripes*) is a MIS for the wetland and water community type. Forest wide WMNF wildlife monitoring surveys detected black duck during all four years of wetland bird monitoring (1993-1996). Their habitat is available and well distributed in the White Mountain Subsection, yet more limited in mountainous terrain and their population is considered viable on the forest (USDA-FS 2001). The headwater portions of Davis Brook in the Ramsey Basin Project Area does not provide suitable aquatic habitat, but the downstream perennial portion near the confluence with the Wild Ammonoosuc River may.

**Eastern brook trout** (*Salvelinus fontinalis*) is a MIS for permanent lakes, ponds, and stream community types on the WMNF (USDA-LRMP 1986a, MIS VII-B-9). This trout requires cool continuous flowing water, up and downstream passage, sediment free gravels for spawning and egg incubation, instream hiding cover, and non-turbid water for feeding on macroinvertebrates (USDI 1982). Eastern brook trout use sheltered, downstream sides of boulders or overhanging banks that are out of direct currents (Scarola 1987). In New Hampshire, this trout typically spawns in areas of groundwater upwelling during late October or early November. Spawning can occur at temperatures ranging from 40 to 50°F (Scarola 1987). Spawning success is reduced as the amount of fine sediments in the water increases. The NH Fish and Game Department (NHFG) manage this trout as a game species. Eastern brook trout are distributed nationwide and statewide, and wild MIS Eastern brook trout populations in all major watersheds of the WMNF are considered viable (USDA FS 2001a). FS surveys of the Project Area determined the headwaters of Davis Brook did not provide suitable habitat (USDA-FS 1998, 2003).

Eastern Brook Trout Stocking: Based on site-specific ID-team field reviews, Bio Tech field reviews, fish habitat suitability index models, and NH F&G Stocking Records, the headwater portions of Davis Brook within the Project Area do not contain resident MIS Eastern Brook Trout (USDA-FS 1998, 2003; USDI 1982 & 97, NHFG 1991-2000). Davis Brook (only the intermittent headwater portion is in the Ramsey Basin Project Area) do not appear on NHFG stocking records as being stocked with hatchery-reared Eastern brook trout. The ephemeral and intermittent portions of Davis Brook, within the Ramsey Basin Project Area do not provide suitable spawning or rearing habitat for Eastern brook trout or other fishes, but they provide habitat for various other aquatic/semi-aquatic biota such as amphibians, reptiles and macroinvertebrates.

**Atlantic salmon** (*Salmo salar*) is not a WMNF MIS, but there is an interagency effort to re-establish a self-sustaining population in the Connecticut River basin. In a final rule, the National Marine Fisheries Service and the U.S. Fish and Wildlife Service determined endangered species status (per the amended Endangered Species Act of 1973) for the Gulf of Maine distinct population segment of Atlantic salmon. The final rule (USDI, 2000a) did not include endangered status for the Central New England population segment due to extirpation status (which includes New Hampshire). Salmon fry are not stocked in Davis Brook, but salmon fry are stocked in the Wild Ammonoosuc River located outside the Project Area.

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### Aquatic Resources Affected Environment

The proposed Ramsey Basin Project Area is located on moderately sloped terrain within the headwater portions of the Davis Brook and contains a small beaver pond. These aquatic ecosystems drain into and influence the water quality and quantity of downstream aquatic

habitat within the main stem Wild Ammonoosuc River. Collectively, these rivers are part of the Connecticut River basin.

#### *Site-Specific Project Area Aquatic Surveys:*

Forest Service ID-Team and Bio Technician site-specific field reviews documented the condition of aquatic habitat and the adjacent riparian zone of Davis and the beaver pond within the proposed Ramsey Basin Project Area (USDA-FS 1998-2003). These reviews during various times of the year which documented that the proposed Ramsey Basin Project Area does not contain unique aquatic habitat such as USGS mapped wetlands, bog meadows, or vernal pools meeting state documentation guidelines (NHFG 1997).

The riparian habitat within the proposed Ramsey Basin Project Area contains a northern hardwood and mixedwood forest type primarily of sugar maple and yellow birch and scattered hemlock and white pine. The dominant understory vegetation is hardwood saplings and associated common ground flora (see Vegetation Report). The existing riparian vegetation functions to retard sediment delivery into stream courses, maintain stream bank stability, and provide streamside shade to maintain cooler summer instream water temperatures for fish habitat in perennial portions of Davis Brook. The riparian area also provides leaf matter and wood debris recruitment to the forest floor as suitable amphibian and reptile habitat. The riparian vegetation provides approximately 75% of the food base via organic matter such as fruits, twigs, and leaves. This vegetation functions as an energy source (allochthonous) for the food chain in the aquatic ecosystems within the Ramsey Basin Project Area.

In summary, the riparian integrity, water quality, and substrate quality indicators estimated in streams located within the Ramsey Basin Project Area during site-specific reviews, met the WMNF Fish Habitat Standards and Guidelines for MIS Eastern brook trout and Atlantic salmon (USDA-LRMP 1986a, III-15a, b, as amended 11/06/89). No natural catastrophic events or human caused developments occurred since these surveys to substantially alter these habitat indicators.

#### *Amphibian and Reptile Habitat*

The aquatic habitat associated with the proposed Ramsey Basin Project Area supports aquatic and semi-aquatic biota such as amphibians and reptiles and likely the full suit of coldwater macroinvertebrates. The 12 species of salamanders and 10 species of frogs that occur in New Hampshire have extensive ranges outside of the state (NHFG 1996). There are seven species of turtles, one of which (box turtle) may be an introduction since no evidence of breeding has been reported. Wood and snapping turtles are found statewide, while painted turtles find the northern limit of their range in the White Mountain subsection and the common musk turtle are mostly absent from that area which includes the Ramsey Basin Project Area. The Blanding's and spotted turtle are dependant on marshy wetlands and are found primarily in the Gulf of Maine Costal Plain. Thus, the box, musk, Blanding's and spotted turtles are assumed absent from the Ramsey Basin Project Area due to lack of suitable habitat and no known documented occurrence due to the project area located outside of their known range.

#### *TEPS and Other Aquatic Species of Concern*

Davis Brook and the associated riparian zones and the small beaver pond provide suitable habitat for the Regional Forester-listed Sensitive Species wood turtle (*Clemmys insculpta*). Also, the aquatic portions of the project area provides suitable habitat for the State-listed species-of-special-concern Jefferson salamander (*Ambystoma jeffersonianum*). However, there are no known documented occurrences of Federal or RFSS amphibians or reptiles or

other aquatic or semi aquatic species of concern (see Appendix F) within the proposed Ramsey Basin Project Area (NHFG 1996, Taylor 1993). No aquatic species were detected during field surveys (USDA-FS 1998, 2003) or FS interdisciplinary team field reviews.

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### Aquatic Resources - Related Mitigation Measures

- Large coarse woody material on the ground in the riparian area and outside of harvest units shall be left in place for amphibian and reptile habitat
- Designate major skid trails and minimize the number of stream crossings
- Winter harvesting only

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### Direct and Indirect Effects on Aquatic Resources

This EA used the habitat indicators of **riparian integrity**, **water quality** and **substrate quality** (Table 4 in Aquatic Functional Report) to determine the potential direct, indirect, and cumulative effects of the No Action and action alternatives on the amount and quality of aquatic habitat for MIS Eastern brook trout and MIS American black duck per (36 CFR 219.19).

#### *Potential Direct and Indirect Effects on Riparian and Aquatic Resources:*

In general, direct effects from vegetation management on aquatic species and habitat can include immediate changes in the water quality parameters of turbidity and instream temperatures. Turbidity caused by suspended fine sediment from surface erosion entering stream courses can clog breathing gills and intake feeding structures in fish and aquatic insects. Turbid water can decrease a trout's ability to visually locate food and mates by sight. Turbidity can force resident fish out of their immediate territories until the water clears. An indirect effect of turbidity is sedimentation, which can affect fish populations long-term. For example, the aquatic organisms upon which fish feed can be eliminated from their substrate habitat by scouring sediment, eventually affecting fish distributions and growth, especially the fry stage. Heavy sedimentation of the interstitial spaces of gravel and cobble substrate can smother bottom-dwelling insects and eggs and fry of gravel nesting fish such as trout.

Removal of riparian vegetation providing streamside shade can increase instream temperatures thereby affecting fish populations long-term. Loss of streamside shade can cause warmer instream temperatures thereby decreasing the amount of dissolved oxygen available in the water. Warmer instream temperatures increase a trout's demand for dissolved oxygen, affecting fish and aquatic biota survivorship.

Vegetation management can cause similar effects to amphibian and reptile habitat (water quality and quantity) described above, and can affect terrestrial habitat such as travel impediments or increased forest floor temperatures from solar penetration.

#### *Alternative 1 - No Action*

No road reconstruction, skid road, or landing construction or reuse and no tree removal associated with vegetation management would occur at this time within the Project Area.

#### *Riparian Integrity:*

This alternative would cause no direct or indirect effects on the existing condition of the stream banks or potential for woody material recruitment into Davis Brook. However, there would be a lost opportunity to increase the amount of open forest canopy for light and solar

warmth to the forest floor and increase the amount of early-successional habitat. These microclimate features and seral stage are important to some invertebrate species, which are prey base for many wildlife species including aquatic and semi aquatic amphibian and reptile (Litvaitis et al. 1999).

**Water Quality:**

There would be no potential for point or non-point chemicals such as gas, oil, grease, or sediment generated or transported from vegetation management activities into stream courses. Thus no direct or indirect affects to terrestrial and instream amphibian, reptile, or fish habitat parameters such instream temperatures or turbidity.

**Substrate Quality:**

There would be no potential for sediment generated or transported into streams, thus no direct or indirect effects of sedimentation affecting instream substrate quality (cobble embeddedness).

**Atlantic Salmon, MIS Eastern Brook Trout and American Black Duck:**

There would be no reduction in the overall condition of the riparian integrity/stream bank stability or water and substrate quality in Davis Brook or the Wild Ammonoosuc River from the No Action. Alternative 1 would not adversely affect existing Atlantic salmon larvae (fry) and juvenile rearing essential fish habitat downstream in the Wild Ammonoosuc River. Alternative 1 would not adversely affect MIS Eastern brook trout, American black duck, or other aquatic species of concern population trends or viability within the Forest-wide planning area.

***Alternative 2 -Proposed Action: (follows discussion of Alternative 3 on p. 72)***

***Alternative 3 - Modified Proposed Action***

There would be a very low potential for minor, localized and short-term direct and indirect effects to headwater portions of Davis Brook and the unnamed intermittent “feeder” tributaries in the Ramsey Basin Project Area.

**Riparian Integrity:**

Riparian and Fish Habitat Standards and Guidelines (USDA-LRMP 1986a, III 15-16) call for maintaining 50% of the basal area within 50 feet of perennial streams, and for retention of large over-mature trees for woody debris recruitment into upper perennial and transition streams such as the lower portions of Davis Brook. Alternative 3 proposes maintaining a 50-foot buffer adjacent to perennial streams. A direct effect of these riparian buffers would retard potential chemicals and sediment, help maintain existing instream water temperatures, protect stream banks. An indirect effect over time would be future terrestrial and instream woody material recruitment (nutrient loading) into the aquatic ecosystems associated with the Ramsey Basin Project Area. The Standards and Guidelines would protect the integrity of the riparian area and stream bank stability within the Ramsey Basin Project Area for amphibians and reptiles and MIS American black duck.

Amphibian and Reptile Habitat (see the Ramsey Basin BE in project file for detailed analysis of potential effects to the wood turtle). One of the most important factors affecting amphibian abundance appears to be forest litter depth, particularly in eastern hardwood forests (DeGraaf and Rudis 1990 cited in Harlow et al. 1997). Riparian and Fish Habitat Standards and Guidelines (USDA-LRMP 1986a, III 15-16) would maintain the potential for accumulation of leaf matter and woody material recruitment to the forest floor available as suitable habitat

for amphibians and reptiles. The trees remaining between harvested areas and logging slash left on the ground would help mitigate the direct effects of tree removal by providing a layer of ground cover for shade and areas of accumulated leaf litter and create cooler micro-sites. Also designated landings and skid trails, and winter harvest that minimize soil compaction and leaf litter disruption might shorten the length of recovery time for amphibian species associated with a particular microhabitat (deMaynaidier and Hunter 1995 cited in Harlow et al. 1997). Even though there would be direct effect of a declined amount of habitat available to salamanders and reptiles within the harvest units of the project area, salamanders still may exist in high numbers in adjacent, mature, second-growth stands, especially at the landscape level in the designated wilderness areas on the WMNF thereby maintaining overall biodiversity (NHFG 1996). Salamanders are small and easily overlooked, but their biomass (total weight) per unit area can exceed that of breeding birds in New Hampshire forests (Burton and Likens 1975).

Gibbs (1998) found that simple linear landscape structures such as roads and ditches might represent physical barriers for amphibian migration routes. Indirect effects of obstacles may impede amphibians from traveling to breeding and foraging areas. However, the proposed road and skid trail reconstruction and temporary culverts or skidder bridge crossings on intermittent or perennial channels would not pose travel barriers to spring or fall migration of obligate species utterly dependent upon wetland or vernal pool habitat for their survival such as the wood frog and the Jefferson salamander (undocumented in project area). Furthermore, no vernal pools were found during FS interdisciplinary team and site-specific field reviews. Wet areas such as the small beaver pond are routinely avoided and excluded from proposed harvest units.

**Water Quality:**

Using log landings and skidding associated with harvesting has the potential to generate/deliver sediment into streams at crossings. Suspended sediment in the water column could cause localized turbidity and potential displacement of resident fishes and other aquatic species. The proposed temporary pipe culverts and skidder bridges located at designated stream crossings within the proposed Ramsey Basin Project Area (used successfully elsewhere across the forest per Sale Administrator Review Reports) would insure additional protection of water quality (turbidity and instream temperatures). Best Management Practices (BMPs) would protect the water quality for amphibian, reptile and MIS Eastern brook trout and American black duck habitat within the aquatic ecosystems.

**Substrate Quality:**

There would be no new road construction and the minor pre-haul maintenance of the existing Forest Service Road System already in place has low potential for minor sediment delivery into mostly the non-fish bearing intermittent streams. The potential amount of sediment generated and delivered into the intermittent, headwater streams affecting substrate quality causing cobble embeddedness within the Ramsey Basin Project Area during harvesting would be minimal because State BMPs such as winter harvesting and compliance with LRMP Standards and Guidelines would minimize soil disturbances. If transported and settled out, sedimentation could affect downstream fish habitat, such as MIS Eastern brook trout spawning and rearing areas downstream in the perennial portions of Davis Brook located outside of the Project Area (USDA 1998, 2003). Bridge construction and stream crossings on high value fisheries streams would not occur during October and April to avoid egg loss due to possible sedimentation (USDA-LRMP 1986a, VII-B-20). These BMPs include

designated skid trails with erosion control at landings, crossings and haul routes. Young of the year MIS brook trout fry may use an active intermittent stream to escape predation or adults may use the lower reaches for spawning. The headwater portions of the intermittent streams within the proposed Ramsey Basin Project Area do not provide suitable fish habitat directly. Fish passage through temporary pipe culverts on intermittent channels or under a skidder bridge would not pose a migration barrier to fishes including MIS Eastern brook trout.

#### *Alternatives 2 & 4*

The same minor, localized, and short-term direct and indirect effects to amphibian, reptile, and fish habitat including MIS Eastern brook trout as related to riparian integrity, water quality, and substrate quality, and travel impediments and displacement as described under Alternative 3 would occur. The same effects would occur because the same stands, access roads, and similar amounts of skid trails and new log landings are proposed under Alternatives 2 and 4. However, the magnitude of direct and indirect effects to amphibian, reptile, and fish habitat including MIS Eastern brook trout and American black duck from Alternatives 2 has the potential to be slightly more than the Modified Proposed Action because a greater total of stand acres would be treated and/or a greater amount of clearcutting is proposed and more timber volume would be skidded along the trails. Alternative 4 would also cause similar direct and indirect effects but to a lesser extent due to no clearcut acres and less acres treated. Because implementation of BMPs, Fish Habitat & Riparian Standards and Guidelines, and winter logging mitigation measures described under the Modified Proposed Action would apply to Alternatives 2 and 4, they would minimize potential sediment delivery into stream courses during harvest. The direct and indirect effects of these alternatives on MIS Eastern brook trout and MIS American black duck would not be substantial in terms of duration and magnitude.

#### *Alternative Summary*

The potential direct and indirect effects to riparian, amphibian, reptile, and fish habitat described under the No Action, Modified Proposed Action and Alternatives 2 and 4 are within the range of effects analyzed in the FEIS under the section relating “Effects Of Timber Management Activities On Other Benefits and Resources-Soil and Water” (USDA-FEIS 1986, IV-30, Item 9a.1). Implementation of the Modified Proposed Action or Alternative 2 or 4 would cause localized, minor to no adverse direct or indirect effects on the condition of the ephemeral or intermittent channels, the riparian areas, or perennial fish habitat downstream of the proposed Ramsey Basin Project Area. However, the Modified Proposed Action or Alternatives 2 and 4 **would not adversely affect existing larvae (fry) and juvenile rearing essential fish habitat for Atlantic salmon. All of the action alternatives would not adversely affect MIS Eastern brook trout, American black duck, or other species of concern population trends or viability within the Forest-wide planning area.**

The action alternatives would incorporate Best Management Practices and Forest Plan Riparian and Fish Habitat Standards and Guidelines for protection and maintenance of Atlantic salmon and MIS Eastern brook trout and MIS American black duck and their habitats. Fish Habitat and Riparian Standards and Guidelines call for maintaining 50% of the basal area along perennial brooks (USDA-LRMP 1986a, III-15-16). Installation of erosion control water bars, ditching techniques on landings and skid trails, or temporary stream crossings would limit sediment delivery and help maintain suitable instream temperatures and allow for future woody material recruitment into the stream courses thereby maintaining aquatic

habitat diversity within the Project Area. Furthermore, the proposed Ramsey Basin Project Area is located on moderately sloped terrain with ample amounts of ground cover vegetation. Harvesting activity during firm or frozen winter ground conditions would limit the potential for soil transport into the stream courses. Stream crossings would not pose a barrier to spring or fall migration of amphibian species. No new road construction and minor amounts of road maintenance of existing forest road is proposed. Road and soil mitigation measures designed to minimize soil and slope disturbances, would prevent sedimentation of cobble substrate within and downstream from the Ramsey Basin Project Area.

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## Cumulative Effects on Aquatic Resources

The analysis area for cumulative effects included the Ramsey Basin Project Area. The WMNF landscape and regional scales were used to facilitate discussion on MIS population trends and viability. The Davis Brook sub-watershed downstream at the confluence with the Wild Ammonoosuc River was considered for the Atlantic salmon. The temporal scope was 10 years (when HMUs are reevaluated).

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

Because there would be no direct or indirect effects from implementation of Alternative 1, the No Action would not add adverse cumulative effects to the existing condition of aquatic habitat for Atlantic salmon or MIS Eastern brook trout or MIS American black duck. However, the No Action would add an adverse cumulative effect of no increased open forest canopy for light and solar warmth reaching the forest floor and increased amount of early-successional habitat. These light and thermal microclimate features and the habitat seral stage are important to some terrestrial and aquatic invertebrate insect species who use early-successional plant hosts for food (see Wildlife Functional Report in the Ramsey Basin Project File). In turn, these invertebrates become prey base for many wildlife species including cold blooded amphibian and reptiles, which also use these open canopy areas in forested habitat to gain solar warmth (Litvaitis et al. 1999).

### *Alternatives 2 and 4:*

Historical logging practices affected instream habitat conditions in New Hampshire (Taylor et al. 1996). The stream inventories conducted across the WMNF indicate that most streams have suitable instream habitat needed by trout including coldwater temperatures and good hiding cover. However, surveys indicate a lack of habitat diversity with the percentage of pools below the recommended guideline (USDA-FS 1986a). The action alternatives should not have any substantial effect on current instream habitat conditions because maintaining large trees adjacent to streams would allow for recruitment of large woody material into these streams. Large wood recruitment may increase the amount of pool habitat in these systems in the future since (Likens and Bilby 1982).

The cumulative effects on amphibian, reptile, and fish habitat from implementation of the Modified Proposed Action or Alternatives 2 or 4 are expected to be none, since a relatively moderate percentage of the overall sub-watersheds in HMUs 118 would be treated and soil erosion mitigation measures would be implemented. Furthermore, there was no evidence of active erosion on old skid trails or landings (which have revegetated) noted during site-specific interdisciplinary team field reviews of the proposed project area from past management activities. Existing roads, landings, and skid trails are stable and, unless they have a gravel surface, are revegetated. Nearby areas harvested during the 1980's have revegetated into saplings approximately 10 to 15 feet high or greater.

The EAs completed for the nearby Boutin Corner and Titus II Vegetation Management Projects determined low potential for minor direct and indirect, to no cumulative effects to aquatic species or their habitat within the Project Areas. There are no foreseeable future vegetation management activities proposed within the Ramey Basin Project Area. Other management actions would adhere to similar Forest Plan Standards and Guidelines and best management practices for erosion control as planned for the proposed Ramsey Basin Project.

The Modified Proposed Action and Alternatives 2 and 4 would adhere to Forest Plan Standards and Guidelines for protecting and maintaining fish and riparian habitat and **would not cause adverse cumulative effects to Essential Fish Habitat for Atlantic salmon.** The Modified Proposed Action and Alternatives 2 and 4 **would not cause adverse cumulative effects to MIS Eastern brook trout or American black duck population viability within the forest-wide planning area,** or other aquatic species of concern. The potential effects to amphibian, reptile, fish and riparian habitat described in this analysis are within the scope and range of effects described in the WMNF FEIS (USDA 1986, IV-30, Item 9a. 1) under the section relating Effects of Timber Management Activities on Other Benefits and Resources - Soil and Water.

## Socio-economic Environment

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### Cultural Resources

No Unresolved Issues Related to Cultural Resources

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### Cultural Resources Affected Environment

Cultural resource surveys have been conducted for the Ramsey Basin Project Area (CRRR#s 023–029, 031, 065–068). No prehistoric sites were found during shovel test pit digs in likely areas. Recorded historic sites include:

- Several homesteads scattered along Ramsey Basin Road (FR146), off the North South Road (FR19), and off of FR145.
- Two sugar houses.
- Old bridge abutments where FR146 crosses Davis Brook.

The cultural sites in the project area are a result of past settlement in the nineteenth century. Visible remains include cellar holes, foundations, and stonewalls in various states of disrepair. Vegetation growing in and around cellar holes and foundations and natural weathering can continue to cause these sites to collapse. Occasional visitors to these sites may also disturb the structures.

When the historic bridge abutments were surveyed in 1982, the western abutment was collapsed. The historic abutments are five feet above the stream. The existing bridge at that site is supported on the banks back from and above the historic bridge abutments. The existing bridge is approximately seven feet above the stream.

Some sites are located within or near proposed treatment units. There may be additional sites in the Project Area that have not been discovered.

### Cultural Resources - Related Mitigation Measures

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- Project layout will insure avoidance of known cultural sites. Buffers around known sites will be laid out in accordance with SHPO (State Historic Preservation Office)

direction

- If, in the course of any project activities, previously unknown sites or artifacts are located, activities will stop immediately in that location. The district heritage paraprofessional and Forest archaeologist will be called in to evaluate the finds and make recommendations on how to proceed
- Units containing or near known cultural sites will be logged on frozen ground to help protect historic values associated with the sites
- For the continued protection of the historic bridge abutments at Davis Brook on FR146, the current bridge will remain above and back from the old abutments

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## Direct and Indirect Effects on Cultural Resources

### *Alternative 1 - No Action*

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

### *Alternative 2-4*

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

Under Alternatives 2-4, known sites within the project area will be avoided during layout, marking, and logging operations. The mitigation measures listed above are designed to eliminate or lessen any impacts to heritage sites or site values from timber harvesting. These mitigations are in accordance with State Historic Preservation Office (SHPO) guidance and have been used successfully on other similar vegetation management projects across the Forest. This includes keeping the current bridge abutments where FR146 crosses Davis Brook above the historic abutments.

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

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

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## Cumulative Effects on Cultural Resources

For cultural resource analysis purposes, the scope of the cumulative effects area is the Ramsey Basin Project Area (Compartment 44). Choosing a wider area might dilute any possible cumulative effects on the heritage resource. Previous timber harvesting occurred in the 1980s. Therefore, the time span is the present through the coming decade, 2014. No additional activities are planned for this Project in the coming decade.

The Ramsey Basin Project Area is part of the larger HMU 118 (Compartments 44-47). The Howe Hill Timber Sale (Compartment 46; completed 1997) and the Titus Brook Timber Sale (Compartment 47; completed winter 2003-4) and the previous timber sale in

Compartment 44 all employed similar mitigation measures, prescribed by SHPO to protect heritage resources. These mitigation measures have been successful in protecting known heritage sites.

No cumulative effects are anticipated beyond the effects discussed in Direct and Indirect Effects above.

## Recreation

No Unresolved Issues Related to Recreation

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### Recreation Affected Environment

The recreational setting for the Ramsey Basin Project Area is Roaded Natural (Recreation Opportunity Spectrum (ROS) Class, MA 3.1, Forest Plan, p. III-36; Forest Plan, ROS, Appendix H). Primary recreation activities within the project area include: hiking, hunting, cross-country skiing, snowmobiling, dispersed camping, fishing, driving for pleasure, and mountain biking.

#### *Driving For Pleasure*

The North South Road is a lightly used Forest Service Road (FR19), which connects Glenclif in the south to Boutin Corner in the north. It is the road access to the Long Pond Road which terminates at Long Pond boat launch and picnic area. Once the gravel road has dried out in the spring so that vehicle traffic won't create ruts, FR 19 is opened to the public. It is left open for the summer and closed in late fall when alternating freezing and thawing weather cycles cause the road to become soft or the road becomes unsafe due to snow and ice. In general the Forest Service tries to open the road as early as possible to allow access to Long Pond for fishing. The Forest Service also tries to keep the road open in the fall as long as possible to allow access for hunters.

#### *Trails*

There are no hiking trails in the project area. During the summer, FR19 and FR146 are occasionally used for mountain biking and hiking. In winter, when FR19 is not plowed for timber hauling, the road is used as a snowmobile trail. In the late 1980s, FR127, FR146, FR145 and FR142 were used for snowmobiling when not used for timber management. These roads connected to snowmobile trails and continued off the Forest to private land. These connections, part of the snowmobile trail system under the current Forest Plan, have not been regularly maintained. There has been little, if any, snowmobile use except for FR19 and FR127 in recent years.

#### *Dispersed Camping*

Camping is permitted along FR19 however there are few suitable location. Campers are required to display a White Mountain National Forest Parking Pass to park.

#### *Hunting*

Based on local knowledge and direct observations, small and big game hunting activity associated with this area is moderate to heavy (personnel communication with Forest Service Biologist Weloth). This area receives heavy big game hunting pressure, particularly moose hunting. This is related to previous timber management activities, specifically regeneration (clearcutting) of the aspen-paper birch type, which moose and deer frequently browse. (See the Terrestrial Resources section of this document for further information).

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## Recreation - Related Mitigation Measures

In addition to the generally applicable Forest and Management area-wide Standards and Guidelines listed in the Forest Plan in section III and Appendix VIIB, pp. 18-22, the following specific mitigation or coordination measures would be used in implementing the proposed activities.

- Snowmobiles will be restricted from using the North South Road (FR19) north of the Long Pond Road (FR127) when the road is plowed for timber hauling
- During winter operations, signs indicating “No Snowmobiling” will be posted at all entry points to FR19 north of the Long Pond Road. These signs would be required by the sale contract. Coordination with snowmobile clubs will occur prior to sale activity. This coordination would be required in the sale contract
- For visual considerations, groups in Stand 2 will be placed no closer than 66 feet from the North South Road
- Along the edge of the North South Road (FR19), all slash from purchasers operations will be removed a distance of 50' and lopped to within 3' of the ground for another 50'

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## Direct and Indirect Effects on Recreation

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

There would be no effect to dispersed camping opportunities from any alternative.

### *Alternative 1*

No new activities would be implemented during this entry under Alternative 1. No direct or indirect effects are anticipated to the recreational experiences of visitors to the project area.

There is currently no early-successional habitat in the Ramsey Basin Project Area. Under Alternative 1, no early-successional habitat would be created unless through natural events such as windstorm, fire, or disease. This would favor wildlife that depends primarily on mature and over-mature habitat. Wildlife that depends on early-successional habitat (game species) for some part of their life cycle would continue to decrease as trees in the project mature. Indirectly, this could reduce the hunting opportunities in the area as well as the ability of visitors to view these wildlife species (see Terrestrial Wildlife section above, pp. 43-65).

### *Alternatives 2-4*

Group selection harvesting will occur along the North South Road in Stand 2 (see Visual Section for a more detailed explanation, pp. 78-81, below). Visitors driving or snowmobiling along the road may notice a difference in the character of the woods where groups have been harvested. See Photo 5, p. 18. Groups located in Stand 2 would appear the same.

Because harvesting would be restricted to the winter season, and visitor use will be restricted during harvesting, the sights and sound of logging would not impact recreation use. However, Alternatives 2-4 would negatively affect snowmobiling, because harvesting operations would require closing the northern end of the North South Road (FR19) for 2 to 4 years.

Alternative 2 (92 acres; 10.8% of Compartment 44) and Alternative 3 (63 acres; 7.4% of Compartment 44) would create early-successional habitat. This would provide habitat for game species that use this habitat component (see Terrestrial Wildlife section, pp. 43-65, above). Indirectly, this could improve the hunting opportunities in the area as well as the ability of visitors to view these wildlife species (see Terrestrial Wildlife section above, pp. 43-65).

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## Cumulative Effects on Recreation

The cumulative effects area chosen for recreation is HMU 118 (Compartments 44-47; approximately 6040 Ac), because the activities proposed in the Ramsey Basin Project Area and the potential effects of those activities are the same as past and future activities. Additionally, the North South Road (FR19), which forms the western boundary of the Project Area, bisects HMU 118. Past Activities (see the Transportation and Vegetation sections, above) include the Howe Hill (Compartment 46, completed 1997) and the Titus Brook (Compartment 47, completed winter 2003-4) Timber sales. Similar activities are expected to take place in Compartment 45, sometime after 2006. The time frame for the cumulative effects analysis for recreation is therefore, 1997 through 2014 when harvesting in HMU 118 would be completed for this entry cycle.

### *Alternatives 1-4*

While no activities would occur in the Ramsey Basin Project Area under Alternative 1, some clearcutting (approximately 20 acres) and group selection (approximately 40 acres) could occur in Compartment 45. This harvesting would occur during the winter, and snowmobiling would be prohibited during harvesting. Under Alternatives 2-4, the North South Road would be closed to snowmobiling, north of the Long Pond access road during harvest operations from the Ramsey Basin Project and later during the Compartment 45 project.

Visual effects resulting from harvesting operations are short term in nature. By ten years after harvesting trees will have grown up enough so that a temporary opening is filled in, and stumps and slash are covered by vegetation. The effects would be the same as detailed above under Direct and Indirect Effects.

Harvesting could occur in HMU 118 for 1-2 years under Alternative 1, and from 2-5 years under Alternatives 2-4. Because the North South Road would be closed to snowmobiling during harvesting operations, this would have a negative effect on snowmobiling.

Under Alternatives 1 and 4, early-successional habitat would decrease from a maximum of approximately 1.2% of HMU 118 in 2003 to approximately 0.3% by 2014. Under Alternative 2, early-successional habitat would increase to a maximum of approximately 2.2% of HMU 118 in 2006 and decrease to approximately 1.6% by 2014. Alternative 3 is slightly less than Alternative 2, with an increase to a maximum of 1.8% in 2006 to approximately 1.2% by 2014. Indirectly, this could affect the hunting opportunities in the area as well as the ability of visitors to view these wildlife species (see Terrestrial Wildlife section above, pp. 43-65). As early successional habitat increases, these opportunities increase, and as early-successional habitat grows into the next age class, these opportunities decrease.

## Visual Quality

**Issue 1 (p. 5):** The amount of clearcutting and overstory removal proposed in this project area will have a negative effect(s) on . . . visual resources, especially when added to the clearcutting that has occurred on adjacent public and private land (cumulative impact).

**Measure 1c:** Temporary openings visible from the North South Road in HMU 118 provided through 2014.

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### Visual Affected Environment

The Ramsey Basin Project Area is a forested landscape and is typical of management area 3.1 lands. It is a coming together of scattered softwood and mixed hardwood stands in a landscape that is dominated by hardwood vegetation.

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

There are no superior viewpoints for the Ramsey Basin project area.

The North South Road, with a Visual Quality Objective (VQO) of Partial Retention, is the only road in the project open to recreational visitor use (driving and snowmobiling seasonally).

Human activity within and around the project area is noticeable. This includes evidence of past timber harvesting activities and snowmobiling.

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### Visual - Related Mitigation Measures

- Slash disposal will be required along the North South Road and the Ramsey Basin Road (FR 19 and 146). All slash will be removed a distance of 50' and lopped to within 3' of the ground for another 50'
- Groups in Stand 2 will be placed no closer than 66 feet from the North South Road

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### Direct and Indirect Effects on Visuals

#### *Alternative 1 - No Action*

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

#### *Alternatives 2-4*

Stand 2, proposed for group selection in Alternatives 2-4, is the only treated stand that would be visible from the North South Road. Groups are located no closer to the road than 66 feet. Photo 5, p. 18, is of a recent group cut in the adjacent Titus Brook Timber Sale and was taken from the North South Road. The group selection cuts in Stand 2 are expected to appear the same in Alternatives 2-4.

Slash disposal along road would mitigate the effect of harvesting in Stand 2 by removing slash within 50 feet of the road, by reducing the height of slash beyond 50 feet, and making

stumps less visible. The proposed unit has been designed to soften the transition between groups and uncut areas to avoid abrupt changes in canopy heights and density.

Evidence of harvesting activity would be of irregular size and shape and would be in harmony with the naturally appearing landscape under Alternatives 2-4, and the VQO of Partial Retention will be maintained.

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### Cumulative Effects on Visuals

There are no superior viewpoints for HMU 118, which includes the Ramsey Basin Project Area. Therefore, the cumulative effects area for the visual analysis is the same seen area as used for the direct/indirect effects, the North South Road. The cumulative effects period is from 1997 (the end of harvesting in Compartment 46) to 2016 (ten years from the anticipated completion of activities proposed in the Ramsey Basin Project).

There appears to be no trend towards clearcutting on private land in Benton, and this includes the private land adjacent to the North South Road (personal observation and aerial photo analysis).

Although there are some old clearcut units adjacent to the southern end of the North South Road, the current VQO for this road is partial retention, and clearcuts are no longer prescribed adjacent to the road. Uneven-aged management (group and single-tree selection) prescriptions meet the VQO of partial retention. The Titus Brook project (Compartment 47) had group selection harvesting adjacent to the North South Road, but individual groups were located at least 66 feet from the road and slash disposal mitigations removed slash up to 50 feet from the road and lopped slash beyond that. The result is that the individual group harvest units are minimally visible from the road. See Photo 5, p. 18, above. Only one harvest unit (Stand 2) is located adjacent to the North South Road. The prescription for Stand 2 is group selection, and the same mitigation measures as used in the Titus Brook Project would be applied to the same effect. The effect of any group selections proposed adjacent to the North South Road would also be similar to Titus Brook.

All previous clearcuts adjacent to the North South Road are greater than 15 years old and the existing vegetation has reached a height greater than 15 feet (Photo 2, p. 17). There are no clearcuts on private land adjacent to the North South Road.

The most recent timber harvesting activities along the North South Road have occurred in the Titus Brook Timber Sale. They were ? group selection units, all of which met the VQO of Partial Retention.

Compartment 44, south of the Ramsey Basin Project Area, and adjacent to the North South Road is scheduled for potential treatment in 2006. Any treatments proposed adjacent to the North South Road would be group selection harvesting and would have to meet the VQO of Partial Retention (group/single-tree selection), and would be subject to the same visual mitigations as the unit proposed in the Ramsey Basin Project.

Because of the mitigation measures proposed in the Ramsey Basin Project and similar mitigations that would be used in any activities proposed in Compartment 45, there would be no change in the VQO under any alternative.

No clearcutting is expected to take place along the North South Road in HMU 118 or on Private land north of HMU 118.

*Alternative 1 - No Action*

The only additional harvesting that would take place prior to 2016 would be in Compartment 45. The effects of this harvesting would be as described under Direct and Indirect Effects, Alternatives 2-4, above, and would apply to those portions of Compartments 45-47 adjacent to the North South Road.

*Alternatives 2-4*

Additional harvesting that would take place prior to 2016 would be in Compartment 44 (Ramsey Basin) and Compartment 45. The effects of this harvesting would be as described under Direct and Indirect Effects, Alternatives 2-4, above, and would apply to those portions of Compartments 44-47 adjacent to the North South Road

**Community, Environmental Justice, & Economics**

No Unresolved Issues Related to Community, Environmental Justice, & Economics

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

The Ramsey Basin Project Area (800 Ac) is located on federal land in the Town of Benton (31,200 Ac) in Grafton County, NH. (Map 1). Benton is located on NH Rt. 116 and, by road, is less than one mile northwest of the Project Area. Benton is a rural residential community with a population of 300 people/60 families (2001 census data). There is little employment opportunity within the town, and approximately 92% of workforce commutes to jobs half an hour away. Local employment includes farming, logging, and auto repair. A small portion of the population (3.8% of the families) is below the poverty level. (Demographic information from 2003 Economic & Labor Market Information Bureau, NH Employment Security; updated 05/30/03)

Rt. 116 is a secondary road that connects with NH Rt. 110 to the west in North Haverhill and NH Rt. 112 to the east. The North South Road is gravel surfaced, open during the summer and fall as road conditions permit, and connects to the Town of Glencliff located at the junction with NH Rt. 25 on the south. When open, the North South Road is a popular north/south connector and provides access to the Long Pond fishing and picnic area.

Ownership of the Benton land base is split three ways: federal (75%), Dartmouth Outing Club (8%), and other (17%). Rural communities that include federal land depend for part of their operating revenue on money generated by Forest Service harvesting activities (Timber Tax receipts and disbursements from states to towns from the Secure Rural Schools and Community Self Determination Act, commonly referred to as the 25% Fund).

Recreation in the Ramsey Basin Project Area has been, and continues to be, light. Camping occurs occasionally on old log landings and spur roads along the North South Road. A few visitors park at the gate on FR146 and walk the old skid roads in the Project Area. Snowmobiles use the North South Road. Hunting small and large game is common in the area. Some people fish in Davis Brook.

There appears to be no trend towards clearcutting on private land in the town. However, some terminal harvesting/land conversion is occurring as trees are cleared and new homes are built (personal observation and aerial photo analysis).

The Forest Service has numerous costs associated with implementing a project on the National Forest. Planning costs are 'up front' and involve a number of preliminary steps and associated costs. Planning activities include: silvicultural and biological surveys; fieldwork, development

of stand prescriptions, and project layout; data collection and entry; planning meetings; public involvement; and preparation of an environmental assessment and decision documents.

Table 18 shows the average unit costs for the Ammo/Pemi Ranger District to plan and implement projects. This represents the cost of 'doing business' and is incurred even if the no action alternative is chosen. Timber management projects have associated sale

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

The potential value for timber is the average of (green, no salvage) timber sales sold on the Ammo/Pemi District in FY03 (table 19).

**Table 18: Ammo/Pemi District FY04 Project Costs/MMBF**

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

**Table 19: Timber Sales Sold on the Ammonoosuc/Pemigewasset Ranger District of the White Mountain National Forest in FY03**

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

**Community, Environmental Justice, & Economics Direct and Indirect Effects**

Many of the values generated by the alternatives (positive and negative) involve goods and services that are not priced in the market place and, are not represented in this comparison. These goods and services involve such things as the value of a hunting experience, a hike in the woods, watching wildlife, or the quality of water flowing from the project area. Possible effects each alternative has on these types of non-priced goods and services can be found elsewhere in Chapter 3 under other resource headings. The cost of producing some of these non-priced goods, i.e. creating new wildlife habitat, is included in the total cost figures.

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

The work involved in planning and analyzing this project included the fieldwork and analysis necessary to evaluate a maximum number of treated acres and associated volume (Alternative 2, 1.4 MMBF). If a lesser number of acres and associated volume are proposed and analyzed in another alternative, the overall planning costs of the project would be the same:

$$1.4 \text{ MMBF} \times \$35,200 = \$49,280$$

Table 20 displays the federal cost/benefit analysis for the implementation of Alternatives 1-4 and the potential 10% Timber Tax revenue for Benton.

**Table 20: Net Return to the Federal Treasury, Contribution to the 25% Fund, and Timber Tax Revenue From Implementation of Alternatives 1-4**

Activity	Alt 1	Alt 2 (1.4 MMBF)	Alt 3 (1.1 MMBF)	Alt 4 (0.6 MMBF)
<b>Costs:</b>				
Planning	\$49,280	\$49,280	\$49,280	\$49,280
Sale Prep	\$0	\$43,820	\$34,430	\$18,780
Sale Admin	\$0	\$18,480	\$14,520	\$7,992
<b>Total Costs:</b>	<b>\$49,280</b>	<b>\$111,580</b>	<b>\$98,230</b>	<b>\$76,052</b>
<b>Revenue:</b>	<b>\$0</b>	<b>\$226,432</b>	<b>\$177,912</b>	<b>\$97,043</b>
<b>Total Net Value</b>	<b>-\$49,280</b>	<b>\$114,853</b>	<b>\$79,682</b>	<b>\$20,991</b>
<b>Potential Contribution to the 25% Fund</b>	<b>\$0</b>	<b>\$56,608</b>	<b>\$44,478</b>	<b>\$24,261</b>
<b>Potential 10% Timber Tax Revenue to Benton</b>	<b>\$0</b>	<b>\$22,643</b>	<b>\$17,791</b>	<b>\$9,704</b>

*Alternative 1 - No Action*

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

*Alternatives 2-4*

There would be limited seasonal employment and income opportunities generated by the timber harvesting from the implementation of Alternatives 2-4.

The Revenue figure in Table 20, above, is used as the estimated bid value of the timber that would be harvested from the Ramsey Basin Project. Using an average timber tax value of 10%, the approximate Timber Tax revenue returned to Benton is displayed below. Payments under the Timber Tax would be spread over the life of the sale.

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

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

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

Benton receives economic benefits from timber harvesting that occurs on federal land within the town. Ramsey Basin is within the Town of Benton. Therefore, the cumulative effects area for Community, Environmental Justice, & Economics is limited to Benton.

There are three projects on federal land in Benton that need to be included in past and foreseeable future actions. The Titus Brook Timber Sale was harvested between 1997 and 2003. In addition to the Ramsey Basin Project, two additional projects (Compartment 45 and Stark Falls – Compartments 38, 39, 41) are expected to occur within this decade (2004-2014). Therefore, the time frame for the cumulative effects analysis is 1997-2014. The

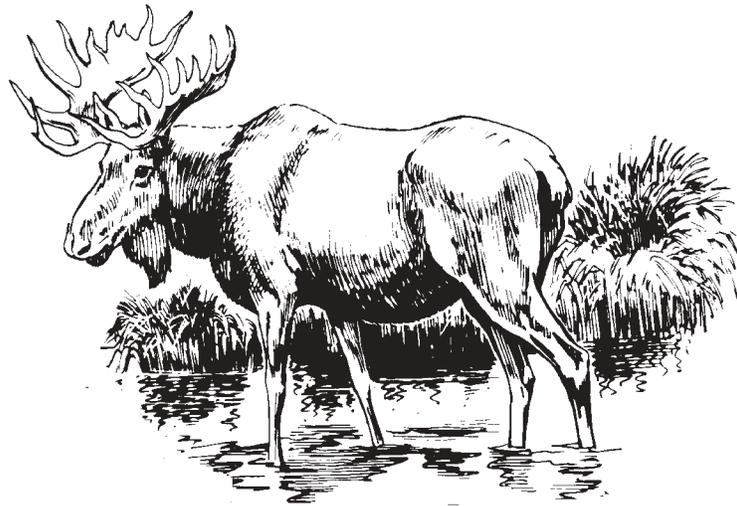


Table E-1a: Mitigation Measures

Resource	Location	Mitigation Action and Type	Purpose of Mitigation	When to Accomplish
Aquatic	All Units	Large coarse woody material on the ground in riparian area and outside of harvest units shall be left in place for amphibian and reptile habitat. <b>Avoidance</b>	To maintain amphibian and reptile habitat.	During marking
	Sale area as applicable	Designate major skid trails and minimize the number of stream crossings. <b>Minimize</b>	To reduce potential for sediment reaching stream courses	During project planning and implementation
	Project Planning	The wetland areas near stands 9, 39, and 45 will be protected. <b>Avoidance</b>	To maintain wetland areas.	Project planning and implementation
Aquatic/ Soils & Water	Project Planning	Winter Harvesting where feasible. <b>Minimize</b>	To reduce potential for sediment reaching stream courses.	Project planning and implementation
Heritage	Project Area	If, in the course of any project activities, previously unknown sites or artifacts are located, activities will stop immediately in that location. The district heritage professional and Forest archaeologist will be called in to evaluate the finds and make recommendations on how to proceed. <b>Minimize, Avoidance</b>	To protect cultural resource sites.	Project layout, During implementation
		Project layout will insure avoidance of known cultural sites. Buffers around known sites will be laid out in accordance with SHPO (State Historic Preservation Office) direction. <b>Avoidance</b>		
		Units containing or near known cultural sites will be logged on frozen ground to help protect historic values associated with the sites. <b>Minimize, Avoidance</b>		
		For the continued protection of the historic bridge abutments at Davis Brook on FR146, the current bridge will remain above and back from the old abutments. <b>Avoidance</b>		
Recreation, Transportation	FR 19	Close the North South Road (FSDR 19) during winter operations, signs indicating "No Snowmobiling" will be posted at all entry points to Forest Road 19. These signs would be required by the sale contract. Coordination with snowmobile clubs will occur prior to sale activity. This coordination would be required in the sale contract. <b>Avoidance</b>	Public Safety	
Recreation		During winter operations, signs indicating "No Snowmobiling" will be posted at all entry points to Forest Road 19. These signs would be required by the sale contract. Coordination with snowmobile clubs will occur prior to sale activity. This coordination would be required in the sale contract. <b>Avoidance</b>		During implementation
Transportation, Soils & Water	Project Area	Close roads to use and hauling in wet seasons. Maintain drainage structures, filtering areas, decelerators and sediment traps. <b>Minimize</b>	To reduce deterioration of roads during spring when frost leaves the roads and soils are saturated	Sale Administration
		The exact location of log landings, main skid trails and stream crossings would be agreed upon in advance with the sale administrator and District staff. The size or location of log landing locations will not be altered without the approval of the sale administrator. <b>Minimize</b>	To reduce the impact from transportation corridors and potential for sediment reaching stream courses; Minimize disturbance and to protect TEPS plant species.	Sale layout, Marking, and Administration
		Upon completion of harvesting operations, any temporary roads constructed to facilitate access will be closed and obliterated. <b>Minimize</b>	To reduce the impact from transportation corridors and potential for sediment reaching stream courses	Sale layout, Marking, and Administration
Vegetation	All Treatment Units	Indigenous, minority tree species or beech trees genetically resistant to scale complex would be encouraged in uneven-aged treatments by cutting trees around them that compete for space and resources. In even-aged regeneration treatments, these species would be protected and buffered with a group of other leaf trees. <b>Minimize</b>	To preserve and protect minority species, thus enhancing diversity	Sale layout, marking, and administration

Table E-1a: Mitigation Measures

Resource	Location	Mitigation Action and Type	Purpose of Mitigation	When to Accomplish
Vegetation	Timber Sales	Use native vegetation and straw (if available) during revegetation practices per Executive Order 13112, 23/99. <b>Minimize</b>	To prevent introduction of noxious invasive weed species.	Sale Administration
		If listed plants are found during project implementation, the sale administrator would alert the district biologist and botanist and protective measures would be taken. <b>Avoidance</b>	To protect TEPS plant species.	
Vegetation, wildlife		In clearcuts/overstory removals, a mix of residual trees would be left to improve wildlife habitat, modify the visual appearance of the stand and add diversity to the composition of the future stand. In clearcuts or group selection treatments, where residual understory plants interfere with the germination and development of desirable tree seedlings, a mechanical site preparation treatment would be used to control low shade. If seedlings develop, but are controlled by residual vegetation, a release treatment (TSI) would be applied by removing some of the interfering woody vegetation. <b>Maintenance</b>	To provide growing space for a mix of desirable trees and to meet Forest Plan wildlife habitat diversity objectives.	Sale Administration
Vegetation		Regeneration treatments, even- and uneven-aged, will be followed by surveys to determine the success of natural regeneration. If natural regeneration fails, then new trees grown from local seed sources would be planted. If species mix is not meeting objectives or if there are desirable, minority of wildlife trees being suppressed, a timber stand improvement (TSI) treatment will be used to release a desirable mix of young trees. <b>Maintenance</b>	To insure successful regeneration takes place, and that species mix meets treatment objectives.	Sale layout, marking, and administration
Vegetation, soil, & water		Winter harvest only. <b>Avoidance</b>	Protect soils and TEPS plant species via frozen ground conditions.	Ecosystem Team
Vegetation		All action alternatives would use non-invasive seed mix and straw mulch (where and when available) and as needed to prevent the introduction of invasive exotic plant species during revegetation closure work during revegetation practices per Executive Order 13112, 23/99.	To prevent introduction of noxious invasive weed species.	Sale Administrator
Visual	North South Road	Groups in Stand 2 will be placed no closer than 66 feet from the North South Road. <b>Minimize</b>	Visual considerations	
		Along the edge of the North South Road (NFSR 19), all slash from purchasers operations will be removed a distance of 50' and lopped to within 3' of the ground for another 50'	Visual considerations	During marking and implementation
Wildlife	All Units	Retain mast producing beech trees heavily used by black bear unless a safety hazard, or located in regeneration units. <b>Avoidance</b>	To provide mast food and diversity for wildlife.	
		Retain existing large downed woody material in proposed harvest units on the forest floor where feasible. <b>Avoidance</b>	To provide wildlife habitat.	During marking
		All action alternatives would retain snags per USFWS BO Terms & Conditions and Forest Plan TES Amendment. If snags are felled, retain as large woody material on the ground. As much as practicable within OSHA regulations. <b>Avoidance</b>	For the protection of Indiana bat unless a safety hazard.	During marking and harvesting

Table E-1a: Mitigation Measures

Resource	Location	Mitigation Action and Type	Purpose of Mitigation	When to Accomplish
Wildlife	Project Area	Large coarse woody material on the ground in the riparian area and outside of harvest units shall be left in place for amphibian and reptile habitat	To maintain amphibian and reptile habitat.	During marking and harvesting
		All action alternatives are consistent with applicable standards and guidelines outlined in the Canada Lynx Conservation Assessment and Strategy for the maintenance of suitable lynx habitat. <b>Avoidance</b>	To protect potential lynx habitat.	Project Planning and implementation
Wildlife/ Vegetation	Group Selection Units	Retain some red oak trees. <b>Avoidance</b>	To provide mast food and diversity for wildlife.	During marking and harvesting

Table E-2: Comparison of Alternatives by Stand Prescriptions

Stand	Stand Acres	New Stand	New Stand Acres	Forest Type	Alt 2 Proposed Action	Treatment Acres	Alt 3	Treatment Acres	Alt 4	Treatment Acres	Season
2	18	2	19	Mixed Hardwood/Softwood	Group Selection (<1/5 Ac)	4	Group Selection (<1/5 Ac)	4	Group Selection (<1/5 Ac)	4	Winter
4	11	4	11	Spruce Fir	Overstory Removal	11	Overstory Removal	11	Group Selection (<1/5 Ac)	2	Winter
5	25	5	25	Northern Hardwood	Single-Tree Selection	25	Single-Tree Selection	25	Single-Tree Selection	25	Winter
6	11	6	12	Spruce Fir	Overstory Removal	12	Overstory Removal	12	Group Selection (<1/5 Ac)	2	Winter
8	30	8	34	Northern Hardwood	Single-Tree Selection	34	Single-Tree Selection	34	Single-Tree Selection	34	Winter
9	14	9	21	Mixed Hardwood/Softwood	Clearcut	21	Group Selection (<1/5 Ac)	4	Group Selection (<1/5 Ac)	4	Winter
10	16	44	15	Mixed Hardwood/Softwood	Clearcut	15	Clearcut	15	Group Selection (<1/5 Ac)	3	Winter
11	10	11	11	Northern Hardwood	Clearcut	11	Clearcut	11	Group Selection (<1/5 Ac)	2	Winter
14	14	14	18	Northern Hardwood	Clearcut	14	Clearcut	14	Group Selection (<1/5 Ac)	3	Winter
22	24	45	23	Mixed Hardwood/Softwood	Group Selection (<1/5 Ac)	5	Group Selection (<1/5 Ac)	5	Group Selection (<1/5 Ac)	5	Winter
23	20	23	20	Mixed Hardwood/Softwood	Group Selection (<1/5 Ac)	4	Group Selection (<1/5 Ac)	4	Group Selection (<1/5 Ac)	4	Winter
25	8	46	8	Northern Hardwood	Single-Tree Selection	8	Single-Tree Selection	8	Single-Tree Selection	8	Winter
26	13	26	13	Mixed Hardwood/Softwood	Group Selection (<1/5 Ac)	3	Group Selection (<1/5 Ac)	3	Group Selection (<1/5 Ac)	3	Winter
30	7	30	5	Spruce Fir	Group Selection (<1/5 Ac)	1	Group Selection (<1/5 Ac)	1	Group Selection (<1/5 Ac)	1	Winter
34	13	34	20	Mixed Hardwood/Softwood	Group Selection (<1/5 Ac)	4	Group Selection (<1/5 Ac)	4	Group Selection (<1/5 Ac)	4	Winter
36	14	36	14	Northern Hardwood	Single-Tree Selection	14	Single-Tree Selection	14	Single-Tree Selection	14	Winter
37	7	37	13	Northern Hardwood	Single-Tree Selection	7	Single-Tree Selection	7	Single-Tree Selection	7	Winter
39	8	39	16	Northern Hardwood	Clearcut	8	Group Selection (<1/5 Ac)	3	Group Selection (<1/5 Ac)	3	Winter
<b>Total Stand Ac</b>	<b>263</b>		<b>298</b>		<b>Alternative 2 Total Treatment Ac</b>	<b>201</b>	<b>Alternative 3 Total Treatment Ac</b>	<b>179</b>	<b>Alternative 4 Total Treatment Ac</b>	<b>122</b>	

Table E-1a: Mitigation Measures

Resource	Location	Mitigation Action and Type	Purpose of Mitigation	When to Accomplish
Aquatic	All Units	Large coarse woody material on the ground in riparian area and outside of harvest units shall be left in place for amphibian and reptile habitat. <b>Avoidance</b>	To maintain amphibian and reptile habitat.	During marking
	Sale area as applicable	Designate major skid trails and minimize the number of stream crossings. <b>Minimize</b>	To reduce potential for sediment reaching stream courses	During project planning and implementation
	Project Planning	The wetland areas near stands 9, 39, and 45 will be protected. <b>Avoidance</b>	To maintain wetland areas.	Project planning and implementation
Aquatic/ Soils & Water	Project Planning	Winter Harvesting where feasible. <b>Minimize</b>	To reduce potential for sediment reaching stream courses.	Project planning and implementation
Heritage	Project Area	If, in the course of any project activities, previously unknown sites or artifacts are located, activities will stop immediately in that location. The district heritage professional and Forest archaeologist will be called in to evaluate the finds and make recommendations on how to proceed. <b>Minimize, Avoidance</b>	To protect cultural resource sites.	Project layout, During implementation
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Recreation		During winter operations, signs indicating "No Snowmobiling" will be posted at all entry points to Forest Road 19. These signs would be required by the sale contract. Coordination with snowmobile clubs will occur prior to sale activity. This coordination would be required in the sale contract. <b>Avoidance</b>		During implementation
Transportation, Soils & Water	Project Area	Close roads to use and hauling in wet seasons. Maintain drainage structures, filtering areas, decelerators and sediment traps. <b>Minimize</b>	To reduce deterioration of roads during spring when frost leaves the roads and soils are saturated	Sale Administration
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